Ministry of Foreign Affairs

IOB Evaluation

Food for thought

Review of Dutch food security policy 2012-2016

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Preface

Since 2008, after a period of neglect, there has been renewed interest in agriculture and food security, partly in response to the worldwide rise in food prices in 2008 and to concerns about food security. Yet the number of malnourished people in the world remains high, and the resource base, land, water, and agrobiodiversity, are all under increasing pressure. These problems were addressed by Millennium Development Goal 1 (halving hunger and poverty by 2015) and are now being addressed by Sustainable Development Goal 2, which aims to end hunger and to achieve food security and improved nutrition by 2030, and to promote sustainable agriculture. Agriculture has received more emphasis in the Dutch government's development aid policy since 2008. Moreover, in 2011, the government introduced a food security policy as a priority in its development aid policy aimed at increasing agricultural production in an environmentally sustainable way, improving access to nutritious food, and improving the enabling business environment in developing countries.

This report presents the results of IOB's review of the abovementioned Dutch food security policy in the period 2012-2016. It first describes the policy, the motivation behind it, and the corresponding expenditures; it then analyses the policy's effectiveness, and discusses its efficiency and coherence. Finally, it provides recommendations for improving the policy's effectiveness. The evidence is based on an inventory of food security activities and available evaluations, complemented by the broader literature. In addition, four country case studies were done (in Bangladesh, Ethiopia, Rwanda, and Uganda) involving in each country a qualitative evaluation of the food security programme and a quantitative household impact study of one or two selected projects.

The policy review concludes that Dutch food security policy has been effective in contributing to increased farmer production and income, to an improved business environment, and – by means of specific activities – to reduced hunger and malnutrition. The review also concludes that overall the contribution to reduced hunger and malnutrition has been limited, because part of the agricultural development programme was not designed to make nutritious food available for the current group of malnourished people.

The policy review was conducted by IOB policy researchers Ferko Bodnár and Rob Kuijpers. The team was supported by IOB researchers Antonie de Kemp and Joep Schenk.

The four country studies were carried out by four different evaluation teams, led by Jan Joost Kessler (Aidenvironment) and Philip de Jong (APE) in Bangladesh; Pernille Nagel Sørensen (PS Advice) and Erwin Bulte (WUR) in Ethiopia; Chris Elbers (AIID) and Bas Warmenhoven (PWC) in Rwanda, and Menno Pradan (AIID) and Bas Warmenhoven (PWC) in Uganda. The country reports, which acknowledge the full evaluation teams, have been published under the aegis of the respective organisations, and are also available on the IOB website. Bart de Steenhuisen Piters (KIT) provided support in harmonising the methodology of the four country case studies. Anita Bake worked on the calculations of nutrient adequacy, while Malou van Meijl studied women's perceptions of health, food, and malnutrition in Uganda.

Ruerd Ruben, Wendy Asbeek Brusse, Henri Jorritsma, Antonie de Kemp, Rita Tesselaar and Jan Bade provided internal quality support. Joy Burrough (Unclogged English) provided comments on language and editing. Jochem Hemink (IOB desk editor) assisted with the layout.

An external reference group advised on the report. This group, which was chaired by Wendy Asbeek Brusse, comprised Ken Giller and Inge Brouwer (WUR), Koen Hendriks (Ministry of Finance), Johan Gatsonides and Hans Brand (Ministry of Economic Affairs), Marcel Vernooij, Robert-Jan Scheer, Jeroen Rijniers, Bert Vermaat and Hannah Tijmes from the Ministry of Foreign Affairs.

Staff at the Dutch embassies, from partner organisations and many other informants in Bangladesh, Ethiopia, Rwanda and Uganda, as well as staff of the Food Security Cluster in The Hague, all provided valuable inputs for this policy review. IOB thanks them all for these.

Final responsibility for the report remains with IOB.

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List of acronyms and abbreviations

2SCALE	Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship
aBi-Trust	agricultural Business initiative multi-donor entity
AgDevCo	Africa Agriculture Development Company
AGRA	Alliance for a Green Revolution in Africa
AGP	Agricultural Growth Programme
ARF	Applied Research Fund
ASAP	Agricultural Smallholder Adaptation Programme
ASPIRE	Apiculture Scale-up Programme for Income and Rural Employment
BAGC	Beira Agricultural Growth Corridor
BENEFIT	Partnership to promote food production, income and trade
BMZ	Federal Ministry for Economic Cooperation and Develoment (Germany, *Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung*)
BoP	Bottom of the Pyramid
CAADP	Comprehensive Africa Agriculture Development Programme
CABI	Centre for Agriculture and Biosciences International
CARE	Cooperative for Assistance and Relief Everywhere
CASCAPE	Capacity Building for Scaling up of evidence based best practices in Agricultural Production in Ethiopia
CATALIST	Catalyse Accelerated Agricultural Intensification for Environmental Stability
CBSC	Commodity Business Support Center
CBSD	Cassava Brown Streak Disease
CC	Climate Change
CDSP	Char Development and Settlement Project
CFS	Committee on Food Security
CGIAR	Consultative Group of International Agricultural Research
CGP	Global Challenge Programme
CIDA	Canadian International Development Agency
DANIDA	Danish International Development Agency
DCED	Donor Committee for Enterprise Development
DFID	Department for International Development
DGIS	Directorate-General for International Cooperation
DLO	Agriculture Research Institutes (*Dienst Landbouwkundig Onderzoek*, now part of WUR)
ECDPM	European Centre for Development Policy Management
EDGET	Enhancing Dairy Growth in Ethiopia
ED-HDP	Ethiopian Dutch Horticulture Development Programme
EHPEA	Ethiopian Horticulture Producer Exporters Association
EL&I	Ministry of Economic Affairs, Agriculture and Innovation
ESIRU	Establishing a System of Integrated Resource Utilisation
EU	European Union
FARA	Forum for Agricultural Research in Africa
F&BKP	Food and Business Knowledge Platform

FAO	Food and Agriculture Organization
FDOV	Facility for Sustainable Entrepreneurship and Food Security (*Faciliteit Duurzaam Ondernemen en Voedselzerheid*)
FUPRO	Federation of Producers' Unions (*Fédération des Union des Producteurs*)
G4AW	Geo-Data for Agriculture and Water
GAFSP	Global Agriculture and Food Security Program
GAIN	Global Alliance for Improved Nutrition
GCV FARN	Civil Volunteer Group – Nutrition Learning Group (*Gruppo di Volontariato Civile – Foyer d'Apprentissage et de Réhabitation Nutritionelle*)
GlobalGAP	The Worldwide Standard for Good Agricultural Practices
GLTN	Global Land Tool Network
GNP	Good Nutritional Practices
HABP	Household Asset Building Programme
IBRD	International Bank for Reconstruction and Development
ICARDA	International Center for Agricultural Research in the Dry Areas
ICCO	Interchurch Coordination Committee Development Aid
IDH	Sustainable Trade Initiative (*Initiatief Duurzame Handel*)
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
IFDC	International Fertilizer Development Center
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILC	International Land Coalition
INAS	National Institute of Social Action (*Instituto Nacional da Acção Social*)
IOB	Policy and Operations Evaluation Department
IPM	Integrated Pest Management
ISFM	Integrated Soil Fertility Management
ISSD	Integrated Seed Sector Development
LCG	Local Consultative Group
LIFAM	Linking Farmers to Markets
LODA	Local Administrative Entities Development Agency
LSB	Local Seed Business
MASP	Multi-annual Strategic Plan
MDG	Millennium Development Goal
MDTF	multi-donor trust fund
MFS	multi-annual co-funding scheme for non-governmental organisations (*medefinancieringsstelsel*)
MNP	Micro Nutrient Powder
MPC	Multi Purpose Cooperative
MTR	Mid Term Review
NAIP	National Agricultural Investment Plan
NEAFSEEP	Netherlands East Africa Financial Sector Expertise Exchange Programme
NGO	non-governmental organisation
NICHE	Netherlands Initiative for Capacity development in Higher Education
NFP	Netherlands Fellowship Programmes

NRM	Natural Resource Management
Nuffic	Dutch Organisation for Internationalisation of Education (originally: Netherlands Universities Fellowships For International Cooperation; now a personal name)
NWO	Netherlands Organisation for Scientific Research (*Nederlandse organisatie voor Wetenschappelijk Onderzoek*)
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PAPAB	Supporting Agricultural Productivity in Burundi *(Projet d'Appui à la Productivité Agricole au Burundi)*
PASIC	Policy Action for Sustainable Intensification of Ugandan Cropping systems
PBL	Netherlands Environmental Assessment Agency *(Planbureau voor de Leefomgeving)*
PCR	Project Completion Report
PISP	Participatory Irrigation Sector Project
PNSEB	National Programme of Fertiliser Subsidy in Burundi *(Programme National de Subvention des Engrais au Burundi)*
PPP	Public-private partnerships
PSNP	Productive Safety Net Programme
PROOFS	Profitable Opportunities for Food Security
RAI	Principles for Responsible Agricultural Investment in Agriculture and Food Systems
REACH	Resilient Efficient Agribusiness Chains
RPE	Order on Periodic Evaluation and Policy Information
RVO	Netherlands Enterprise Agency RVO.nl *(Rijksdienst voor Ondernemend Nederland)*
SaFaL	Sustainable Agriculture, Food Security and Linkages
SDG	Sustainable Development Goal
SNV	Netherlands Development Organisation (originally: *Stichting Nederlandse Vrijwilligers*, now a personal name)
SOW-VU	Centre for World Food Studies, Vrije Universiteit Amsterdam *(Stichting Onderzoek Wereldvoedsel-voorziening van de Vrije Universiteit)*
SRHR	Sexual and Reproductive Health and Rights
SSLDP	South Sudan Local Development Project
SUN	Scaling Up Nutrition
UCCCU	Uganda Crane Creameries Cooperative Union
UN	United Nations
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
VCD	Value Chain Development
Veg-IMPACT	Vegetable production and marketing with impact
VGGT	Voluntary Guidelines on the Responsible Governance of Tenure of land, fisheries and forests in the context of national food security
WFP	World Food Programme
WHH	World Hunger Help *(Welthungerhilfe)*
WOTRO	Science for Global Development (originally: *Wetenschappelijk Onderzoek Tropen*, now a personal name)

WRR	The Netherlands Scientific Council for Government Policy *(Wetenschappelijke Raad voor het Regeringsbeleid)*
WTO	World Trade Organization
WUR	Wageningen University and Research
YEP	Young Expert Programme

Summary

Background

Food security is a global concern. The number of malnourished people in the world remains high, and the resource base, land, water, and agrobiodiversity, are all under pressure. This is aggravated by the effects of climate change. Reducing hunger was an internationally agreed goal in the Millennium Development Goals and is now also incorporated in their successors, the Sustainable Development Goals.[1] After a period of declining investments in agriculture by donor agencies between the late 1980s and 2007/2008, there is now renewed interest in agriculture and food security, partly in response to the worldwide rise in food prices in 2008 and to concerns about food security. Agriculture is seen as entry point to reach many of the rural poor, as engine of economic growth, and as provider of environmental services.

In the Netherlands, this renewed interest in agriculture and food security started in 2008 and culminated in the food security policy in development cooperation introduced in 2011 by the Ministry of Foreign Affairs and the Ministry of Economic Affairs. The policy objectives were (1) to increase agricultural production while improving sustainability; (2) to improve access to nutritious food for the most vulnerable people; and (3) to improve the enabling business environment and market functioning in developing countries. The policy was updated in 2014, covering largely the same objectives, but with more emphasis on sustainable food systems and on nutrition-specific activities. Since then, it has also had the aim of contributing to two global food security challenges: reducing hunger and malnutrition in the short to medium term, and making food systems sustainable and resilient, in order to be able to feed the world in the long term.

In the period under review, the Netherlands largely implemented its food security policy through multilateral organisations, international research institutes, and NGOs. About half the food security budget was delegated to the Dutch embassies in partner countries, which developed food security programmes in their multi-annual strategic plans. An important aim of the bilateral programme was to work with private sector and knowledge institutes, preferably in public-private partnerships and with a multi-stakeholder policy dialogue, to develop innovations and market-based structural solutions for agricultural development and food security.

After formulating an overarching Dutch policy on aid, trade and investments in 2013, Dutch policy-makers turned their attention to food security policy – a domain in which the Netherlands and some of its partner countries could transform their relationship from 'aid to trade'.[2] Because of the desire to combine food security policy with private sector development, most projects in the Dutch portfolio focused on market-oriented agricultural development. Between 2011 and 2016, the Netherlands spent a total of about EUR 1.5 billion of the official development assistance (ODA) budget on 248 food security projects. This IOB

[1] MDG1 (2000): halving hunger and poverty by 2015; SDG2 (2015): eliminating hunger and malnutrition by 2030.

[2] The Dutch partner countries considered to be 'transition countries' that could move from an aid relationship to a trade relationship were Bangladesh, Benin, Ethiopia, Ghana, Indonesia, Kenya, Mozambique, and Uganda.

policy review has grouped these projects into 11 'impact pathways' of similar interventions, covering three policy objectives (reorganised for the purpose of this evaluation). Most (56%) of the budget was spent on improving agricultural production and income, followed by improving the enabling business environment (32%), and improving access to nutritious food (12%). The main implementing partners in budgetary terms were multilateral organisations, international research institutes, and NGOs, followed by government and semi- government institutions, Dutch knowledge institutes, and the private sector.

Other policies that influenced the food security programme were private sector development, sustainable water management, the overarching policy on aid, trade investment, and – to a lesser extent – gender, sexual and reproductive health and rights, and civil society building.

The policy review

This report presents the results of IOB's review of the Dutch food security policy in the period 2012-2016. Following the Order on Periodic Evaluation and Policy Information (RPE)[3] guidelines for policy evaluation, it first describes the policy, the motivation behind it, and the corresponding expenditures; it then analyses the policy's effectiveness, discusses its efficiency and coherence, and finally makes recommendations for improving the policy's effectiveness.

The policy review is based on the following elements:

1) An analysis of the Dutch food security policy 2012-2016.
2) An inventory of all activities funded from the food security budget between 2012 and 2016, grouped into 11 so-called 'impact pathways' of similar interventions.
3) Four country case studies (in Bangladesh, Ethiopia, Rwanda and Uganda) involving in each country:
   a) a qualitative evaluation of the Dutch food security programme in its country context, and
   b) a quantitative household impact study of one selected project, using a difference in difference analysis with baseline data of 2014 and endline data of 2016, comparing the project area with a control area.
4) Following the impact pathways, a review of all available evaluations of Dutch food security activities, complemented by evidence from the broader literature.
5) Two minor studies looking at intra-household dynamics in rural farm households and at the co-existence of undernutrition and overnutrition in Uganda.
6) Interviews in the four case study countries and at the Ministry of Foreign Affairs and the Ministry of Economic Affairs.

The food security policy as conceptualised and as implemented in the field was reconstructed on the basis of a desk study and interviews at the two ministries (Chapter 3).

[3] *'Regeling Periodiek Evaluatieonderzoek'* (Ministerie van Financiën, 2014).

Its effectiveness was assessed for each policy objective, considering the projects by grouping similar projects into 11 pathways constructed for this review. Over 50 project evaluations, the country case studies, and evidence from the broader literature allowed more general conclusions to be drawn on the impact pathways followed and their contribution to the three policy objectives (Chapters 4, 5, and 6). The evaluation used this evidence and the broader literature to assess the contribution of the Dutch food security policy to the two global food security challenges: reduced hunger and malnutrition, and sustainable food systems to feed the world in the future (Chapter 7). Efficiency was then assessed, using the limited information available on costs and benefits, and discussing the management costs of the portfolio of 248 projects, followed by a discussion about aid architecture, types of funding, and public-private partnerships (Chapter 8). Finally, the evaluation assessed the coherence and synergy of the policy, based on IOB's four country case studies and interviews (Chapter 9).

Conclusions

1) *The Dutch cabinet's food security memorandum of 2011, and the preceding memorandum on agriculture, rural economic development, and food security (2008), put agricultural development back on the Dutch development cooperation agenda. Since then, Dutch food security policy has focused on sustainably increasing food production – including improving climate resilience – (policy objective 1), on improving access to nutritious food (policy objective 2), and on improving the enabling business environment (policy objective 3). This policy was timely and relevant, given the lack of attention for agricultural development in the previous decade, the food security concerns following the global food crisis in 2007/2008, and recent insights into the importance of mother and child nutrition. The Netherlands has shown commitment by taking on its fair share of the targets set in the global Sustainable Development Goal 2.*

Dutch food security policy has responded to the renewed concerns about malnutrition: around 2008, over 800 million people were undernourished and 2 billion people consumed insufficient micronutrients, while the agricultural resource base (land, water, agrobiodiversity) was under threat, worsened by the effects of climate change. Dutch ODA expenditure on food security almost tripled between 2007 and 2012, reaching on average about EUR 300 million per year. The main emphasis was on rural agricultural development with smallholder farmers, and an approach that favoured public-private partnerships and multi-stakeholder dialogue, which the Netherlands considered critical for agricultural development. The Netherlands also supported various new initiatives for improving nutrition, especially for mothers and young children.

The SDGs have formulated targets for (i) eliminating hunger and malnutrition, (ii) doubling smallholder farmer production and income, and (iii) ensuring sustainable food production systems by 2030. The Netherlands strives to realise a share of 1.6% of these SDG ambitions, and will monitor the realisation of the objectives.

2) *Many projects under the policy objective 'increased sustainable production' have increased farm production and farm household income. The evidence for the positive effects of agricultural research and intensive, small-scale farmer extension is particularly convincing. For value chain development, not many rigorous evaluations exist and the available evidence shows diverging results: from very positive to no effects. Furthermore, value chain development is often less inclusive of poorer farmers. Natural resource management projects, especially in water management, have had positive effects on production and income. Little is known about their long-term effects on environmental sustainability.*

The portfolio of projects shows a large emphasis on value chain development and agricultural research, and much less on farmer extension and natural resource management. The emphasis on value chain development corresponds well with the policy to work with the private sector on market-based solutions which are expected to address constraints not addressed by agricultural research and agricultural extension.

Agricultural research supported by the Netherlands is likely to pay off substantially. A good link between research and extension is crucial, however, and part of the success claimed by research should also be credited to farmer extension and the input value chain development needed for distributing new innovations. The farmer extension projects and programmes

supported by the Netherlands have had positive, albeit modest, effects on technology adoption, even though some of the projects are only halfway through their implementation trajectory. The literature shows that small-scale, intensive farmer field schools are effective in increasing production and income. Farmer extension proves to be more effective in improving farm income when combined with value chain interventions.

It is difficult to assess the impact of value chain development on improving farm production and income because of the shortage of good quality evaluations. Available evidence suggests that the effectiveness of such development depends on the design and implementation of the particular project and the conduciveness of the context in which the project is implemented. Integrated value chain development, which puts farmers at the centre of the intervention, is very promising. The IOB impact study on the 'SAFAL' project in Bangladesh showed that it substantially increased farm production and income by using an intensive and flexible approach in a conducive context. In contrast, the IOB impact study on the 'CATALIST-2' cassava project in Rwanda shows that it had been ineffective during the two-year evaluation period, due to a country-wide outbreak of a cassava disease, the project's inflexible response to emerging constraints, and activities that were spread thinly over a large number of farmers.

Lead-firm value chain development has demonstrated the advantages of reaching large numbers of farmers and of leveraging private sector resources. However, the impact of these projects on overall income of poorer farmers or environmental sustainability is often limited due to a focus on more commercially viable activities. The production and income effects of input value chain development are still unknown. Many seed sector development efforts are ongoing and have not yet been evaluated at final beneficiary level.

Natural resource management for sustainable and climate-smart agriculture includes several water management projects which have had substantial effects on farm production and income. However, there is no evidence of positive effects on environmental sustainability. There are no impact evaluations yet of the recent Dutch-supported IFAD climate change adaption programme. Furthermore, across the portfolio, there is no information about project effects on long-term environmental sustainability. This is partly due to the absence of a country analysis of the sustainability issues that need to be addressed, and to difficulties in capturing sustainability by monitoring and evaluating.

3) *Projects under the policy objective 'increased access to nutritious food' have indeed increased food access and improved the dietary intake and nutritional status of many households. Food fortification has proved to be particularly effective in reaching large numbers of people by involving the private sector and its marketing channels and by lobbying for enforcement by government regulation. However, the effects on vulnerable groups are limited. The effects of social safety nets and projects working on improved nutritional awareness and behaviour are largely positive.*

Well before the launch of the food security policy in 2011, the Netherlands had already invested much in increasing sustainable agricultural production. That year, however, the Ministry of Foreign Affairs added nutrition as a main policy theme. The Ministry then started various types of projects to combat hunger and malnutrition at various levels of hunger and

malnutrition. It supported social safety nets for people experiencing hunger, and also nutrition supplements distributed to vulnerable people (e.g. through health clinics). Industrial food fortification (well known in developed countries) can be part of a more structural solution for persistent large-scale inadequate micronutrient consumption. Another option, which can benefit the entire population, is to improve nutritional awareness and behaviour, including encouraging the home production of nutritious food.

Most social safety net programmes have succeeded in reaching vulnerable households, shortening the hunger period, and improving diet diversity. Food fortification projects, especially industrial, mass food fortification backed by government regulation, as supported by GAIN, have achieved impressive results. They have improved the consumption of specific nutrients for a large portion of the population, at low cost. The initiatives for parallel public distribution systems for micronutrient powders have the advantage of being able to target specific vulnerable groups. The review found that during the 2012-2016 period both government and market-driven distribution systems of micronutrient powders were still in a development phase.

An evaluation of a project financed by the Netherlands working on nutritional awareness and behaviour did find that nutritional knowledge of parents and child weight had been positively influenced. The literature confirms this and shows that projects aiming to raise nutrient awareness and alter behaviour help to improve the quality of food consumption if they are targeted well and if households have sufficient access to food. However, generally the improvement in food consumption is not sufficient to reduce child stunting. An IOB study in southwest Uganda showed that knowledge about healthy food was not always the main constraint to improving nutritional intake: people were aware of the importance of a healthy diet and diet diversity, but were often unaware whether children were stunted, and they had misconceptions about adult overweight. Other factors that affected household food choices include social and cultural habits. Reducing child stunting requires an approach that specifically addresses young child feeding practices.

4) *Projects working on the enabling business environment have facilitated agricultural development to different degrees. In general, investments in rural roads have impacted significantly on agricultural production, poverty reduction, and food access. Improving security of land tenure has reduced land disputes, facilitated land rental markets, and has been inclusive for smallholder farmers and women. Projects intended to strengthen farmer organisations have been effective for the more commercially-oriented organisations whose members are generally relatively better-off farmers. Finally, multi-stake-holder policy dialogue has contributed to better policies and donor investment in the agricultural sector, and to private sector codes of practice and standards.*

There is a broad evidence base showing that investments in roads are effective in stimulating rural development. Roads are known to result in market integration that reduces farm input prices and increases farm output prices, thus encouraging agricultural production for the market. Roads are also known to improve food access for rural and urban consumers by reducing prices of transported food, to enhance the mobility of rural households, and to facilitate off-farm employment. The Netherlands has particularly invested in feeder roads in remoter areas, which has, in general, been shown to be more

cost-effective in lifting people out of poverty than investments in main roads in areas already served by a dense road network.

Land tenure security programmes supported by the Netherlands have been effective in improving land policies, setting up land administration, and issuing land certificates to rural households. In Rwanda, the government land tenure programme, co-financed by the Netherlands, has resulted in improved land tenure security, investments in land management, and in a land rental system that has increased land access for labour-abundant but land-poor households.

How effective capacity-building projects are for producer organisations depends on the characteristics of the recipient organisations. For commercially-oriented producer organisations, whose farmers tend to be slightly better-off, projects of this type often result in better services for the members and in improved market access for farm produce. A longer period of support is often needed to make these organisations self-reliant. In contrast, capacity building of more socially-oriented producer organisations has been less effective in increasing sales or income for their member farmers, who have rarely become financially independent.

Despite weak involvement of private and civil actors, multi-stakeholder dialogue for public policies has resulted in better policies and follow-up donor funding. Multi-stakeholder dialogue for private sector codes of practice and standards (e.g. for improving labour conditions or environmental sustainability) has been successful. Dutch embassies play an important role in this dialogue.

Despite the efforts to make value chains more inclusive, a comparison between value chain development with the private sector and public investment in the enabling business environment (e.g. in land tenure security, rural roads or other infrastructure, or – not evaluated in this review – rural finance) reveals that investments in the enabling business environment are likely to be more inclusive of poorer smallholder farmers with less commercial potential.

5) *Dutch food security policy has contributed to a limited extent to the two global goals of: (a) reducing hunger and malnutrition, and (b) sustainable food systems to feed the world in the future. Through its food security policy, the Netherlands has contributed to the four aspects to be addressed to reduce hunger and malnutrition: making food more available and accessible and (but to a lesser extent) to stabilising food access and food utilisation. The effect of agricultural development projects in terms of reducing hunger and malnutrition is uncertain; the relationship is not as straightforward as is (implicitly) assumed by the policy, and many activities are not inclusive of poorer farmers. Important indirect, structural effects through increased food availability and employment remain speculative, as these have not been included in project design, monitoring, and evaluation. The policy does not explicitly stipulate a long-term focus on sustainable food systems, from production to consumption.*

The literature shows that increased sustainable production resulting from agricultural research, often in combination with farmer training and information services significantly reduces hunger and malnutrition. In contrast, the contribution of value chain development

to this objective is more uncertain. Its effectiveness depends on a *nutrition-sensitive* choice of target group, product, market, and final consumers. An important determinant of the nutritional outcome of an agricultural intervention is the type of crop promoted, since this affects the availability (and price) of nutritious food and of off-farm employment opportunities, and women's decision-making power within the farm household.

Social safety nets, food fortification, and nutritional awareness and behaviour projects target food-insecure people and contribute to improved access to, stability of and utilisation of food. Some of these interventions have had an immediate effect but have not contributed to a long-term solution or to self-reliance in food security. They therefore need to be backed up by more structural solutions.

Projects aiming to improve the enabling business environment have also had positive effect on food security. They have often been inclusive, reaching poorer farmers (land tenure), and off-farm labourers and consumers (roads). Roads in particular improve availability and access, and by improving access to food produced elsewhere contribute to stabilising access to and utilisation of food.

A combination of interventions working in the same area with the same population can create synergy, and may have better nutritional outcomes than a single intervention. For example, adequate nutritional knowledge and gender equality are important to allow households to make informed and balanced decisions on what to produce, consume, and sell, in a context of changing incentives, and for creating consumer demand for nutritious products.

The Netherlands has contributed in providing solutions for many of the key challenges for achieving sustainable food systems that will assure food availability in the future, with an emphasis on the production side: efficiency, farm income, and involvement of the private sector. However, agricultural development projects and value chain development in particular have often taken insufficient account of either the environmental, nutritional and health effects, or the consumer side of the system. Moreover, projects and activities have often been isolated interventions and have not been part of a coherent and integrated strategy needed to tackle these complex and multi-dimensional challenges.

While inclusiveness has gained more emphasis, Dutch food security policy lacks a holistic vision on agricultural transformation and rural transition that distinguishes three different groups of smallholder farmers: (i) farmers who will 'step up' to commercial farming, (ii) farmers that will 'hang in' subsistence farming for the time being, and (iii) farmers who will 'step out' of agriculture. The Dutch interventions focus on the private sector and commercially-oriented farmers who are 'stepping up' or have the potential to do so, and who are often slightly better off. To a limited extent, Dutch-funded interventions support farmers that are 'hanging in', by providing social safety nets. The Ministry of Foreign Affairs aims at creating employment in the agriculture sector, but has not developed an overall strategy for the medium to long term on how to assist the farmers who will have to 'step

out', leave agriculture, and find employment in other economic sectors in the medium to long term.

6) The information available was inadequate for a rigorous assessment of the organisational efficiency or of the cost-effectiveness of Dutch interventions. Nevertheless, it is clear that the great fragmentation of the project portfolio results in high implementation costs. Moreover, there is little evidence that the innovative Dutch projects produce valuable best practices that are scaled up by larger multi-donor or government programmes. More research is needed to find the conditions that allow public-private partnerships to efficiently contribute to the policy objectives.

A rigorous assessment of the cost-effectiveness of Dutch interventions is hampered by the large heterogeneity of projects, their multiple objectives, and the fact that they target different groups under diverse circumstances. It is therefore almost impossible to find 'comparable' projects. Moreover, few evaluations of Dutch and of other donors' projects provide the financial information needed for a benchmark. Only three evaluations of Dutch-funded projects provided enough information to quantify the benefits and to allow for a cost-benefit comparison. These evaluations, in common with other studies, show large variations in cost-benefit ratios. IOB's systematic review of different pathways to food security (2011) concluded that reducing production losses by breeding and distributing disease-tolerant crop varieties and by controlling plant and livestock diseases is a very cost-effective way of improving food security for large groups of farmers, including poorer subsistence farmers in Africa.

One of the implicit assumptions of a heterogeneous programme is that a combination of different types of activities at strategic policy level and at the operational level of farmers and the private sector can create synergy by providing input and feedback between policy dialogue and field operations. Similarly, it is assumed that innovative bilateral projects can be scaled up by large-scale, national programmes funded by multiple donors, and that this creates leverage. However, despite a few good examples, there is not much evidence to support these assumptions. Large-scale projects have been implemented without much evidence of their desired effects. On the other hand, the Ministry of Foreign Affairs has supported innovative small-scale projects that often lacked a strategy for scaling up.

Public-private partnerships are increasingly used as a funding mechanism. They have several potential advantages, including the leverage of private sector knowledge and finance, a reach extending to large groups of producers, employees and consumers, and their financially sustainable market-based solutions. However, public-private partnerships also have the risk of limited additionality, private interests overshadowing public interests, and limited inclusiveness of smallholder farmers. More research is needed, to find (i) the right conditions for different types of public-private partnerships to contribute to public objectives effectively and efficiently, and (ii) the optimal balance between directly supporting the private sector through such partnerships and supporting the enabling business environment.

Finally, the review assessed the implications of a large portfolio for the operational costs of the Ministry of Foreign Affairs. It found that implementing 248 food security projects, many

with small budgets, comes with high operational costs for staff at embassies and the Ministry. This does not contribute to the efficiency of the food security programme.

7) *Embassies play a crucial role in assuring coherence and synergy, as they know the country context. There is scope to improve coherence and synergy, especially (1) within the Dutch food security portfolio of embassy-managed and centrally-managed projects, and (2) between the food security policy, and policies on NGO and civil society support, and the overall Dutch policy on aid, trade, and investment.*

Dutch food security policy is generally well aligned with host country governments' policies and the programmes of other development partners. Nevertheless, many possibilities for synergy are missed, due to a limited context analysis, the fragmentation of funds into numerous geographically and organisationally isolated projects, and limited coordination between centrally-funded projects and embassy-managed programmes. Synergy can be created by working with several development partners and projects together in one geographical area, each tackling some of the many constraints that need to be addressed to advance food security. Embassies are best situated to assure coherence and synergy, but they are constrained by the large number of projects, by the independent organisational set-up of central programmes, and by limited staff capacity.

Dutch food security policy for development is coherent with the overall Dutch policies on international development cooperation and the specific policies relating to the four thematic priorities of the Ministry of Foreign Affairs. In some cases, synergy has been achieved between these priorities: for example, by sustainable water management projects that also contribute to food security objectives. In Bangladesh, for example, the embassy has created a strong link between sexual and reproductive health and rights, and food security projects. Coherence was found to be weak in other cases: for example, between food security and centrally-funded NGO projects for civil society building. Again, this was due to the independent organisational set-up of centrally-funded programmes. Coherence between the food security policy and the overall aid, trade, and investment policy is often not optimal, due to different perceptions of the hierarchy of the policy objectives. This may well result in trade-offs rather than synergies.

Recommendations

For a more effective policy:

1. Create a flexible approach for more innovative interventions whose likely effects are uncertain (e.g. projects in value chain development or natural resource management). This entails starting on a modest (or pilot) scale, and introducing intensive monitoring and evaluation of key project assumptions and of results, so as to learn from these. For well-known interventions whose effectiveness is well established (e.g. in agricultural extension, or infrastructure), joint multi-donor and/or larger government-led programmes are adequate to achieve larger-scale impact.

2. Use a differentiated targeting of farmers, anticipating agricultural transformation and rural transition. Some farmers may be helped by enabling them to transition to commercial farming (stepping up). For others it would be better to leave agriculture and to find off-farm employment (stepping out). In addition, policies should also acknowledge that for many others, subsistence farming remains their only livelihood option for the time being (hanging in). For the commercially-oriented farmers, it is important for the focus to be on helping them to be assured of income, but for subsistence farmers, a stronger focus on nutrition will be important. By emphasising commercial agricultural development, the Netherlands tends to address mainly the stepping-up farmers, yet an inclusive policy for development in a broader sense also needs a strategy to address the farmers who are stepping out or hanging in.

For more food security impact:

3. The current food security policy emphasises agricultural development and the improvement of the enabling business environment. However, to make a greater contribution to reducing hunger and malnutrition, on the basis of this review it is recommended to develop a more holistic approach that considers the food system as a whole: from production, trade, and processing, to consumption. This entails developing an integrated programme rather than funding diverse projects with isolated objectives. It requires a better analysis of the food security situation: taking the rural and urban food-insecure consumer as the starting point for project design in which nutrition-sensitive agriculture is one possible solution; paying more attention to gender in intra-household dynamics; and involving both the public and private sectors in encouraging consumers to make healthy food choices.

4. To make a greater contribution to sustainable food systems to feed the world in the future, the strengths of developing a value chain that considers the whole food system from production to consumption should be combined with seeking solutions for long-term challenges to sustainability: production efficiency, inclusiveness, climate resilience, sustainability, nutrition and health, and a conducive business environment. This requires a good context analysis plus a context-specific strategy and programme, backed up by systematic monitoring and evaluation.

For more efficiency and a more systemic aid architecture:

5. Reduce the number of activities so as to lower the overhead costs and the management burden at embassies and the Ministry of Foreign Affairs. Having fewer but larger projects would allow for better supervision and technical support, and better-quality evaluations.

6. Monitor the quantitative benefits in order to be able to assess, compare, and improve the cost- effectiveness of interventions. This is only appropriate for groups of interventions that are relatively homogeneous, that work with final beneficiaries where impact can be monitored, and that are beyond the pilot innovation phase.

7. Continue with public-private partnerships for leverage and impact, but ensure additionality, awareness of potential conflicts between public and private interests, and that the public interests are anchored in project design and monitoring. A study comparing different partnership designs and financing modalities of public-private partnerships, and investigating the optimal balance between supporting the private sector directly and supporting the enabling business environment could guide future private sector instruments for food security.

8. Create stronger links between the different types of food security interventions (strategic policy dialogue, large-scale implementation for impact, and innovative pilot projects) and monitor whether the assumed synergies between these projects funded by the Netherlands or other donor-funded projects are achieved.

For more synergy and coherence:

9. Address the multiple constraints to food security by improving coherence and synergy among activities. This can be achieved by providing better context analyses, reducing the number of isolated projects, and by better coordination and collaboration with programmes of host governments and other donors. This requires additional staff capacity at the embassies.

10. For coherence with other Dutch development policies, in particular the policy on aid, trade, and investments, the hierarchy of policy objectives needs to be clarified. Activities funded from the food security budget should have food security as their overall objective, and may at the same time contribute to other policy objectives, as long as there is no trade-off with the food security objective.

For strategic learning and policy development:[4]

11. Plan and design evaluations more strategically, within a knowledge agenda, to inform policy for food security. Develop theory on the changes that occur along the different pathways to food security, as this will help identify the main assumptions and critical questions that we are uncertain about. Consider focusing on key questions and knowledge gaps in the whole portfolio rather than evaluating all activities superficially, as this is more useful for strategic learning. Measuring effectiveness and strategic learning may require an implementation period of 10-15 years, which is longer than the duration of most projects. Besides end-of project evaluations, there is room for ex-ante evaluations and for short studies during project (or pilot project) implementation.

[4] This recommendation covers the 'Improvement Paragraph' (*Verbeter Paragraaf*) and will contribute to better policy reviews in the future.

1

Introduction

1.1 The relevance of food security

Food security exists 'when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy live' (FAO, 1996). Food security remains a global concern. Despite significant economic growth and increased prosperity in large parts of the world, nearly 800 million people worldwide still suffer from inadequate energy intake, and about two billion people suffer from micronutrient deficiencies.[5] The effects of undernutrition are particularly severe for mothers and for infants during the first 1000 days since conception. It is estimated that 45% of under-five mortality is attributable to insufficient nutrient intake (Black et al., 2013). Moreover, undernutrition in the first two years of life has irreversible consequences at a later stage, including on education and on adult income: both are lower(Victora et al., 2008). These negative effects of undernutrition are persistent within families and across generations, with a mother's nutritional status during pregnancy affecting the health of her children (The Lancet Series, 2008).

Food insecurity also has broader implications. It can be a major driver of socio-political instability and conflict. Rising food prices in particular, such as experienced in 2007-2008 and 2010-2011, are identified as a cause of social unrest (Bellemare, 2015) and as one of the critical underlying drivers of the Arab uprisings in 2011 (Maystadt et al., 2014). Both directly and indirectly (via its effect on conflict), food insecurity might be an important factor driving migration.[6]

Food security is also intricately linked with the sustainability of natural resources and climate change. Food production requires large amounts of scarce resources, such as water, land, energy, and minerals, and is responsible for one fifth of the global emission of greenhouse gases (FAO, 2016). In the coming years, pressure on these resources is expected to increase, in line with population growth and rising incomes in much of the developing world, as the demand for food (particularly for animal products and processed food) will grow. The Food and Agriculture Organization (FAO) has estimated that in order to meet the demand for food in 2050, annual world production of crops and livestock will need to be 60% higher than it was in 2006. At the same time, it is the agricultural sector that is particularly vulnerable for the expected effects of climate change, such as higher temperatures, more frequent extreme weather events, water shortages, rising sea levels, land degradation, and loss of biodiversity. Climate change and the scarcity of natural resources therefore pose a major threat to the food security of poor families who depend on food production, and to the robustness of the global food system as a whole.

Food security, poverty, and agricultural development are strongly related. Most food-insecure people are poor, live in rural areas, and depend on the agricultural sector.

5 IFPRI, 2016.

6 This is suggested by, for instance, IOM and WFP (2016), *Hunger without borders, The hidden links between food insecurity, violence and migration in the Northern Triangle of Central America* and Deotti and Estruch (2016), *Addressing Rural Youth Migration at its Root Causes: A Conceptual Framework.* However, as yet there is little rigorous empirical evidence available that supports this.

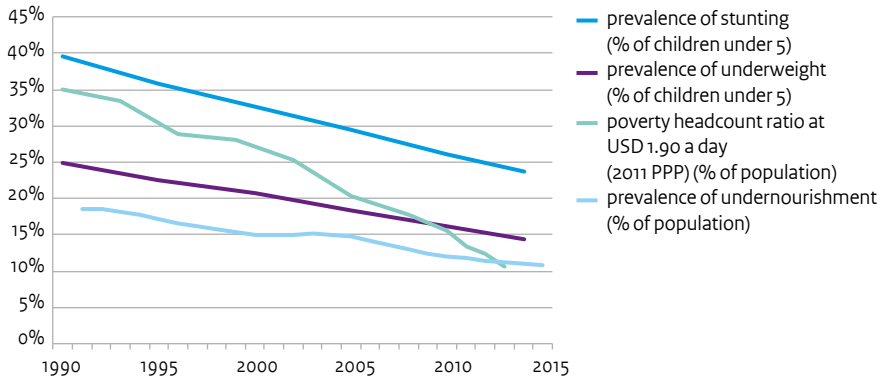
Countries, that have increased agricultural production, especially those in South-East Asia, have also reduced poverty and improved food security. In contrast, in sub-Saharan Africa, progress in agricultural development, poverty reduction, and food security are lagging behind (Van Donge et al., 2012).

The World Development Report 2008 underlined the role of agriculture (i) as entry point for reaching the rural poor, (ii) as engine of economic growth, and (iii) as provider of environmental services (World Bank, 2007). For agriculture-based countries in particular, the report recommended a combination of (i) improving smallholder competitiveness in the medium and higher potential areas, and (ii) ensuring the livelihoods and food security of subsistence farmers.

1.2 Global context

The food security situation in the world has improved spectacularly in recent decades. Fewer people live in poverty and fewer people are undernourished (see Figure 1.1.). In addition, there are fewer children who are stunted (too short for their age) or wasted (underweight for their height).[7] However, the rate of improvement is not the same for all dimensions of food security. As illustrated by the figure, the poverty rate is declining faster than the number of people that are undernourished or the number of children that are stunted or wasted.

Figure 1.1 *Prevalence of food insecurity in the world*



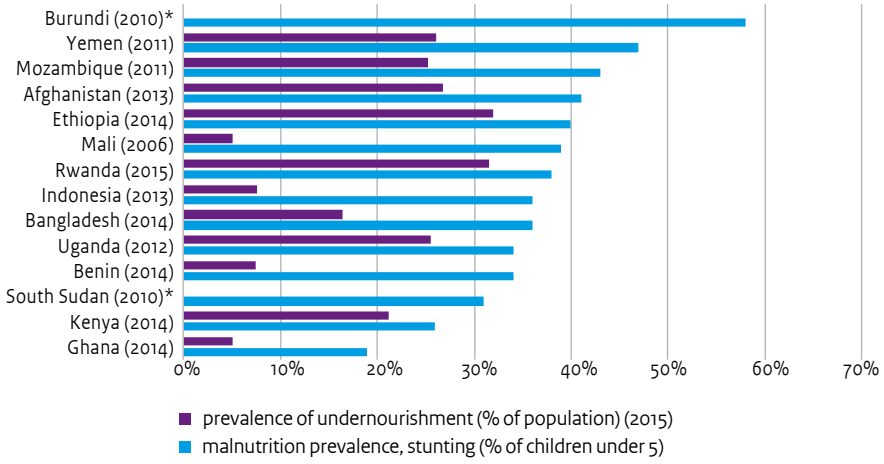
Source: World Bank Health and Nutrition Policy Database and FAO Food Security Indicators Database.
PPP: Purchasing power parity.

[7] No single indicator fully captures food security, as it is a multi-dimensional concept. We therefore use poverty (which is an indicator for access to food), undernourishment (which is an indicator for inadequate energy intake), prevalence of stunting (which indicates a sustained deficiency of micronutrients), and prevalence of wasting (which is an indicator of acute starvation).

These global average trends hide widely different experiences across countries. The observed global decline in food insecurity levels is largely driven by improvements in China, North Africa, Central Asia, and Latin America (see Annex 1). South Asia and sub-Saharan Africa lag behind.[8]

Zooming in on the fifteen Dutch partner countries (Figure 1.2.) we observe that in all countries part of the population is food insecure. The highest rates of food insecurity are observed in Burundi, Yemen, Mozambique, Afghanistan, Ethiopia, Rwanda, and Uganda. Kenya and Ghana are relatively better off, but even in these countries there are pockets of food insecurity. A number of countries, such as Mali, Indonesia, Benin, and Ghana have come a long way in reducing inadequate food access and hunger, but still struggle with high rates of stunting (which indicates that micronutrient deficiencies are still prevalent).

Figure 1.2 *Prevalence of food insecurity in fifteen partner countries of the Netherlands**



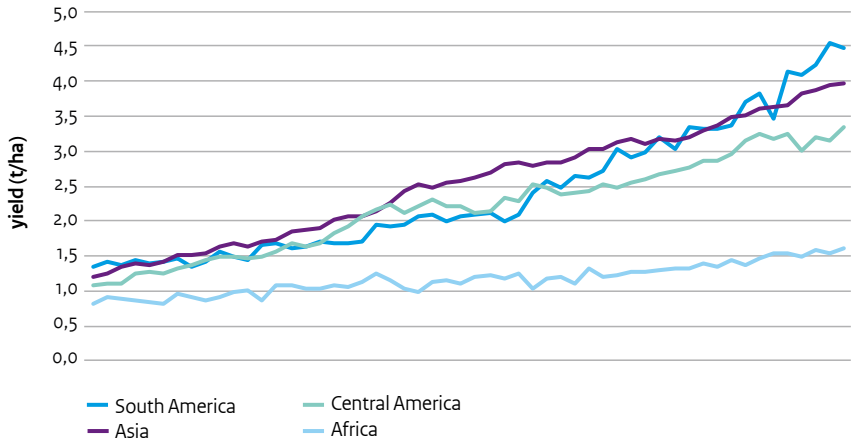
** The figure shows in parentheses the year for which data on stunting prevalence was obtained. Prevalence of undernourishment for Burundi and South Sudan is not shown, due to unreliability of data.*
Source: FAO food security indicators database and International Food Policy Research Institute (IFPRI) (2015) Global Nutrition Report Dataset.

These food security improvements have taken place in a context of major changes in the broader food system: on the supply side (primary production of food), on the demand side, and in the agrifood value chains linking supply and demand.

[8] An important exception is Ghana, which is the only country in sub-Saharan Africa that has shown impressive reductions in both indicators. The prevalence of undernourishment dropped from 47.3% in 1990 to under 5% in 2015, and the prevalence of stunting dropped from 36% in 2003 to 19% in 2014.

The past 50 years have seen impressive growth in food production. The average yield of wheat and maize, for example, has more than tripled since 1961.[9] Africa is the exception as it has seen much lower growth in agricultural productivity (see Figure 1.3 for an illustration), due to inadequate uptake of improved seeds and modern production methods.

Figure 1.3 *Average yield of cereals (t/ha) for four major geographical areas*



Source: FAOstat http://faostat.fao.org/beta/en/#data, accessed 08-nov-16.

These changes in food production are mirrored by big changes in the demand for food. The main driver of food demand is the rapid growth in world population, which has doubled since 1970 to 7.5 billion and is projected to have grown to 9.7 billion by 2050.[10] Africa will account for more than half of this projected growth, as it is expected to more than double its current population in the next 35 years (from 1.2 billion to 2.4 billion people).

In addition to an absolute increase in food demand, there have been important changes in composition of the food consumed; these are a consequence of urbanisation, increased global welfare, and the rise of the middle class in developing countries. Predominantly in Asia (Pingali, 2007), but to a lesser extent also in Africa (Tschirley et al., 2015; Zhou and Staatz, 2016), the proportion of staple crops (i.e. rice, wheat, maize, and potatoes) consumed has fallen and the proportion of meat, fish, dairy, fruit, vegetables, and processed foods consumed has risen. Although this dietary shift has helped reduce malnutrition, it has also led to nearly 2 billion people in the world becoming overweight or obese. Moreover, the shift from a plant-based to an animal-based diet has increased greenhouse gas emissions and land clearing for agriculture worldwide (Tilman and Clark, 2014).

[9] FAOstat http://faostat.fao.org/beta/en/#data, accessed 08-Nov-16.

[10] Projections of population growth have been obtained from United Nations, Department of Economic and Social Affairs, Population Division (2015). World Population Prospects: The 2015 Revision, Key Findings and Advance Tables. Working Paper No. ESA/P/WP.241.

The value chains that connect primary producers with final consumers have also transformed. Through mergers and acquisitions the non-agrarian stages of the food value chain (including farm technology companies, food processors and retailers) have become more concentrated, with fewer companies controlling a greater share of the market. Consequently, relative power (including bargaining power) has shifted towards these conglomerates and away from primary food production. Agrifood value chains have also become more international: for example, today the value of global trade is over five times what it was in 1961.[11] This implies that the global food system has become more interconnected, with consumption in the Netherlands affecting production, processing, and trade in the rest of the world and vice-versa (Wetenschappelijke Raad voor het Regeringsbeleid, 2014).[12]

Finally, both public and private standards (i.e. product or process requirements) have become more widespread and more stringent (Beghin et al., 2015). Examples of public standards include sanitary and phytosanitary regulations (e.g. maximum tolerated levels of chemical residues) and general hygiene standards. Well-known examples of private standards that have been formalised in certification systems include GlobalGap, UTZ Certified, Rainforest Alliance, Fair Trade, and Marine Stewardship Council. Private standards have mainly been introduced by companies and NGOs to substitute for missing or inadequate public standards, and in response to growing consumer concerns regarding safety, quality, and the social and environmental impact of food production. This rise in standards led to the need for alternative forms of value chain organisation (other than the traditional system of spot markets). Large firms (often retailers, processors, or traders) are increasingly 'coordinating' what goes on in the rest of the value chain (Reardon et al., 2009). This coordination typically entails supplier agreements (i.e. contract farming) on product quality, instructions for the production process, and technology transfers.

1.3 Food security in Dutch development cooperation policy

Since 2011, food security has been one of the four Dutch development priority areas ('spearheads'), the other three being sustainable water management, sexual and reproductive health and rights, and security and rule of law. The food security policy letter of 2011[13], drafted jointly by the Ministry of Foreign Affairs and the Ministry of Economic Affairs, combined food security objectives with private sector development objectives. It was constructed around four policy objectives: (1) increasing sustainable agricultural production, (2) improving access to nutritious food, (3) improving markets, and

[11] FAOstat http://faostat.fao.org/beta/en/#data, accessed 08-Nov-16.

[12] Note, however, that most of the food consumed in developing countries is still produced locally (Gehlhar and Regmi, 2005).

[13] '*Uitwerking voedselzekerheidsbeleid*' (Ministerie van Buitenlandse Zaken and Ministerie van Economische Zaken, Landbouw en Innovatie, 2011) [EN: 'Government's policy on food security' (Ministry of Foreign Affairs and the Ministry of Economic Affairs, Agriculture and Innovation, 2011)].

(4) improving the business climate. The follow-up policy letter of 2014[14], also a combined effort of the two ministries, had dropped private sector development as an explicit objective, but maintained a focus on private sector development in a broader 'Dutch diamond approach': the collaboration between governments, private sector, knowledge institutes, and civil society in order to achieve agricultural development and food security. This new policy letter had three sub-objectives: (1) eradicating existing hunger and malnutrition, (2) promoting inclusive and sustainable growth in the agricultural sector, and (3) creating ecologically sustainable food systems. These Dutch policy objectives are expected to contribute to the higher-level International food security goals, including the short-term goal of reducing hunger and malnutrition, and the long-term goal of resilience and environmental sustainability of agricultural production systems, assuring food availability beyond 2050.

1.4 Evaluation questions

The overarching question this review addresses is: How effective was the Dutch food security policy between 2012 and 2016? In accordance with the Dutch government's Order on Periodic Evaluation and Policy Information (*Regeling Periodiek Evaluatieonderzoek*, RPE)[15], the review has unpacked this main question into seven more detailed evaluation questions.

Delimitation and motivation of the policy

1. *What was the content and motivation of the Dutch food security policy 2012-2016?*

Description of the policy and corresponding expenditure

2. *What types of instruments were used and what is their intervention logic?*
3. *What was the expenditure for the different policy sub-components via the different instruments?*

Effectiveness of the policy

4. *What have been the effects of the policy on the policy objectives?*
5. *What has been the impact, i.e. the contribution to the short- and long-term global food security challenges?*
6. *What is the coherence and synergy within the food security programme and in relation to other development policies?*
7. *What can be said about the efficiency or cost-effectiveness of the food security interventions?*

[14] '*Nederlandse inzet voor wereldwijde voedselzekerheid*' (Ministerie van Buitenlandse Zaken and Ministerie van Economische Zaken, 2014) [EN: 'The Netherlands' contribution to global food security' (Ministry of Foreign Affairs and Ministry of Economic Affairs, Agriculture and Innovation, 2014)].

[15] '*Regeling Periodiek Evaluatieonderzoek*' (Ministerie van Financiën, 2014).

1.5 Structure of this report

Chapter 2 starts with an explanation of the evaluation methodology. Chapter 3 follows with a description of the Dutch food security policy and its implementation. Chapters 4, 5, and 6 present the effectiveness of the three policy objectives. Chapter 7 discusses the contribution to global food security in the short and long term. Chapter 8 discusses the efficiency of the food security policy and reviews the aid architecture. Chapter 9 discusses the coherence and synergy within the food security policy, and between the food security policy and other policies.

Final conclusions and recommendations are not presented at the end, but instead are included in the summary at the beginning of the report.

2

Evaluation methodology

2.1 Information sources

To answer the evaluation questions, the policy review included the following elements:

1) An analysis of Dutch food security policy 2012-2016.
2) An inventory of all activities funded from the food security budget between 2012 and 2016, grouped into 11 so-called 'impact pathways' of similar interventions.
3) Four country case studies, in Bangladesh, Ethiopia, Rwanda, and Uganda, with in each country:
   a) a qualitative evaluation of Dutch food security programme in its country context, and
   b) a quantitative household impact study of one or two selected projects, using a difference in difference analysis with baseline data of 2014 and endline data of 2016, comparing the project area with a control area.
4) Following the impact pathways, a review of all available evaluations of Dutch food security activities, complemented by evidence from the broader literature.
5) Two minor studies looking at intra-household dynamics in rural farm households and at the co-existence of undernutrition and overnutrition in Uganda.
6) Interviews in the four case study countries and, in the Netherlands, in the Ministry of Foreign Affairs and the Ministry of Economic Affairs.

2.2 Interpretation of the food security policy

This review of Dutch food security policy in the period 2012-2016 took as its starting point the objectives set out in the two policy letters of 2011 and 2014. We reduced them to three main policy objectives for the entire period, as shown below (with the corresponding main indicators in parentheses):

1. Increased sustainable agricultural production (farm production and income);
2. Improved access to nutritious food (access and consumption of nutritious food, and nutritional status);
3. Improved enabling business environment (various indicators, not harmonised).

We identified three assumptions behind this food security policy that we validated against the evaluation results:

1. Agricultural development focusing on small and medium farmers with potential for producing a marketable surplus will result in higher farm income and economic development, which will improve food security. We consider this the main (implicit) policy assumption, as discussed in Chapter 7.
2. Working with the private sector and with public-private partnerships is the best means of achieving long-term, structural improvements of economic development, inclusiveness, self-reliance, and sustainable agriculture. This is briefly reflected on in Chapter 8.
3. Embassies, in consultation with headquarters, are crucial in coordination and assuring synergy between delegated and central, bilateral and multilateral Dutch-funded activities, and between the Dutch programme and the programmes of the national government and other donors. This is discussed in Chapter 9.

2.3 Country case studies

In addition to the available project evaluations, IOB commissioned four country case studies, each involving an analysis of the food security portfolio, and one household-level impact study (two in Bangladesh). These country studies were used to assess the relevance, effectiveness, coherence, and synergy of the programme; to do so, the project portfolio as a whole in its country context had to be analysed, rather than individual projects.

The project impact studies were designed to assess credibly the effectiveness of a number of innovative projects. By collecting baseline data at the start (2014) and at the end (2016) of the project and by comparing trends in outcome indicators between project participants and control households, these studies were able to attribute observed changes in farm production, household income, and food consumption to project participation.

Countries were selected by considering the budget and diversity of the Dutch food security portfolio, and the presence of an activity that was suitable for an impact evaluation. The projects for the impact studies were selected by considering the likelihood of household-level changes in production or income between 2014 and 2016, and the coverage of different types of activities that were illustrative for a larger group of similar projects. This resulted in the selection of the following countries and projects:

- Bangladesh, with two projects for impact evaluation, in polders in the South West:
  - SAFAL (implemented by Solidaridad): Integrated value chain development
  - Blue Gold (implemented by the Government of Bangladesh): Water management, agricultural extension and value chain development (by the Government of Bangladesh). The project was funded from the sustainable water management budget.[16]
- Ethiopia, with the Integrated seed sector development programme (by the Wageningen Centre for Development Innovation (CDI)). The impact study focused on Tigray.
- Rwanda, with CATALIST-2 (implemented by the International Fertiliser Development Centre (IFDC)): integrated value chain development. The impact study focussed on the cassava component.
- Uganda, with Dairy Sector Development (implemented by the Agricultural Business Initiative (aBi) Trust): Capacity building of farmer organisations (mainly by financing cooling equipment).

Detailed methodologies are found in the individual case study reports, available on the IOB website.[17]

[16] This policy review limited its scope to projects funded from the food security budget, except for a small number of projects funded from the sustainable water management budget in Bangladesh, with clear food security objectives.

[17] Four country case study reports: Aidenvironment-APE-BRAC-IHE, 2017; AIID-PwC, 2017a, 2017b; Ecorys-WUR-NMA, 2017.

2.4 Theory-based analysis and synthesis of evaluations

Using the inventory of 248 projects and the expenditure, we identified 11 different impact pathways, grouping similar interventions. Each impact pathway follows a result chain from activity to outputs and outcomes; first towards the distinct policy objectives, and then extended to the global food security goals. For each impact pathway we identified a number of assumptions, reviewed the available set of evaluations and, where necessary, complemented this with insights from impact evaluations on similar projects not funded by the Netherlands.

We split the analyses of effectiveness per pathway into two steps. First, we assessed the contribution to the three policy objectives (Chapters 4, 5, and 6). Then we assessed the actual or probable contribution to the more ambitious food security challenges of reducing hunger and malnutrition, and assuring more sustainable food systems (Chapter 7). For the validation of the assumed cause-effect relations between household food production, sales, income, food consumption, and nutritional status, IOB collaborated on a review of the broader literature on this subject (Bake, 2017), conducted a qualitative study in Uganda (Van Meijl, 2017), and analysed the pooled data from the impact studies in Rwanda, Bangladesh, and Ethiopia.

2.5 The quality and availability of evaluations

This policy review is a synthesis study based on the available evaluations of the activities underlying the food security policy. The material for this synthesis was gathered by searching the archive of the Ministry of Foreign Affairs and by enquiring at the specific directorates responsible for the activities. The search checked the 172 activities with a project budget in excess of EUR 1 million.

The search resulted in a total of 62 external reports representing EUR 737 million or 49% of the total food security expenditures between 2012 and 2016. This includes 34 mid-term reviews, 24 end-of-project evaluations, and four IOB studies. Each report was assessed and categorised based on the quality of the methodology used to evaluate the activity's effectiveness. The key criterion used to assess this quality was the ability of the evaluation to credibly attribute observed changes in outcome indicators to the project.[18]

Category 4 evaluations (25 reports) do not do an attribution analysis based on a counterfactual or contribution analysis using theory-based evaluation methods. They may provide useful lessons for the project itself or for a follow-up project phase, but they cannot give a reliable indication of the project's effectiveness. Typically, they present anecdotal

[18] We were primarily interested in project *outcomes*, as opposed to project *outputs*. Outputs are those results that can be controlled by the activity (e.g. number of farmer training events provided). Outcomes, on the other hand, can only be *influenced* by the project, as they also depend on external factors. Outcome-level effectivity is more meaningful to assess because outcomes reflect the project's impact on individuals and society. Examples of outcome indicators are knowledge and skills, adoption of practices, access to resources, resource efficiency, food production, household income, food consumption, and nutritional status.

evidence (not supported by a sufficient number of independent sources of information). In other cases, the evaluation only reports on indicators at output level and not at outcome level.

Category 3 evaluations (23 reports) are more useful, as they systematically compare the opinions and perspectives of different project stakeholders and informed independent non-stakeholders on the effectiveness of the project. The weakness of this approach is that it relies solely on the subjective opinion of a relatively small number of individuals. The opinions of the interviewees may be biased for a variety of reasons and because non-project factors are not systematically taken into account.

Category 2 evaluations (5 reports) are the best option for activities where an experimental or quasi-experimental approach is difficult or even impossible. These evaluations use methods such as realist evaluation, contribution analysis, and process tracing (White and Phillips, 2012), which explicitly take into account non-project factors that may influence outcome indicators.

Category 1 evaluations (9 reports) use the most appropriate methodology for quantifying effectiveness by applying an experimental or quasi-experimental approach in which a control group is used to control for outside factors.

Overall, we conclude that the primary evidence base for assessing the effectiveness of the Dutch Food Security Policy is quite limited. There are a number of reasons for this. First, an independent end-evaluation was available for only 28 of the 172 projects (covering 41% of the budget). Secondly, many of the available evaluations focus on processes and practical aspects of activities, with the intention of improving project management, but do not assess the effectiveness of the approach. Thirdly, many of the reports that *do* assess the effectiveness of activities only look at project outputs (and not outcomes) or use a less than ideal evaluation methodology. Finally, for many programmes in the portfolio it truly is difficult to assess the project's effectiveness at outcome level. This is particularly the case for projects that are 'enabling' in nature. For these types of projects, expected outcomes may lie further in the future (e.g. agricultural research) or are part of a longer and more complex intervention logic that largely depends on an uncertain and dynamic context (e.g. capacity development or policy influence).

Finding little evidence from evaluations does not mean that the Dutch food security policy has been ineffective. It simply means there is little evidence available that provides insight into whether the underlying activities have been effective. To accommodate this relative scarcity of evidence we augmented the information in the underlying reports with other sources of information (such as the broader scientific literature), using a theory-based evaluation methodology (see previous section).

2.6 Representativeness, limitations, and scope

The selection of IOB-commissioned country case studies is not representative for the food security programme in the 12 partner countries but does cover a large part (>50%) of the food security budget delegated to the Dutch embassies in partner countries. Grouping activities into impact pathways enabled us to draw conclusions about the logic followed in a larger proportion of project activities from only a limited number of evaluations.

The IOB impact studies of the five individual projects have the following limitations. There were only two years between the baseline survey and the impact survey that covers only part of the total project duration and may have missed effects, especially if implementation was delayed (for example, Blue Gold in Bangladesh). The choice of projects was made in advance and could not be altered, even if it was subsequently discovered that there were major constraints in the context (e.g. cassava diseases in Rwanda), or that the original assumptions behind the project set-up and corresponding evaluation set-up (e.g. seed distribution in Ethiopia; milk sales in Uganda) turned out to be invalid.

In terms of accountability, the policy review is limited to activities funded from the food security budget, with the exception of a few irrigation projects in Bangladesh and Indonesia. The latter are funded from the 'sustainable water management' budget, but are clearly linked to agricultural production and food security. The country case studies and the impact studies focused on the bilateral, embassy-managed activities because we expected that the evaluations of centrally managed and multilateral activities would be of better quality.

Given the foregoing, this review does not look at (i) the achievements of projects funded from the food security budget beyond the food security objectives: for example, results in the field of private sector development; and (ii) the food security achievements of activities funded from other budget lines: for example, funded from the private sector development budget.

3

Dutch food security policy and its implementation 2012-2016

3.1 Policy reconstruction 2012-2016

3.1.1 The Dutch government's renewed interest in food security

A period of declining investments in agriculture by donor agencies and by developing countries' governments between the late 1980s and 2007/2008 (OECD, 2010) was succeeded in 2008 by renewed interest in investments in agriculture and food security.[19] At that time, it was recognised that national economic growth is often insufficient to impact on poorer households, and that to achieve a good nutritional status, calories need to be accompanied by micronutrients, safe drinking water and health care. In 2009, it became clear that in the short term, about 800 million people needed to eat more food (energy) and about 2 billion needed to eat better-quality food (micronutrients). Moreover, to feed the expected 9 billion people by 2050, in the long term, food production needed to increase by 70% in an environmentally sustainable way (FAO, 2009). *The Lancet*'s series on Maternal and Child undernutrition (2008) underlined the importance of addressing undernutrition.

In addition, three reports in particular influenced Dutch food security policy. The World Development Report for 2008 had put agriculture back on the development agenda for its role in (i) reaching the rural poor, (ii) as an engine of economic growth, and (iii) as a provider of environmental services in developing and transition countries (World Bank, 2007). For agriculture-based countries (these include most of Sub-Saharan Africa) in particular, the report recommended a combination of (i) improving smallholder competitiveness in areas of medium and higher potential, and (ii) ensuring the livelihoods and food security of subsistence farmers.[20]

The study 'Tracking development in South-East Asia and sub-Saharan Africa: the primacy of policy', financed by the Ministry of Foreign Affairs, underlined the importance of supporting agricultural development for poverty reduction and economic growth. The research found that major determinants for success were government policies on (i) macroeconomic stabilisation, (ii) improving life in the rural sector, increasing agricultural productivity, and ensuring ample supply of food, and (iii) liberalisation of the economy and creating conditions of economic freedom, particularly for peasant farmers and other small actors. A major difference between South-East Asia and sub-Saharan Africa was the absence of pro-poor policies in sub-Saharan Africa, whereas in South-East Asia there was strong public support in the rural sector, with inclusive agricultural development oriented on food production (Donge and Henley, 2012).

[19] Although Dutch ODA budgets for agriculture declined in the 1990s, the Dutch Ministry of Agriculture retained agriculture on the international agenda.

[20] For agricultural development in general, the report recommends working on (1) access to markets, (2) smallholder competitiveness; (3) livelihoods in subsistence farming and low-skill rural occupation, and (4) employment in agriculture and the rural non-farm economy.

The Scientific Council for Policy report (Van Lieshout et al., 2010) recommended: a shift in the focus of Dutch ODA from social sectors (education, health) to the productive sectors that contribute to economic growth and self-reliance; specialisation in sectors in which the Netherlands contributes added value, including agriculture and water management; and concentration on fewer countries, mainly in Africa.

The international organisations that have played an important role in the renewed attention given by the Netherlands to food security are the Rome institutions (FAO, WFP, and IFAD), the United Nations High Level Tasks Force on the Global Food Security Crisis, the G20 (who initiated the Aquila Food Security Initiative, ratified by the Netherlands), and the World Bank.

Between the late 1980s and 2007, the Dutch Ministry of Foreign Affairs had given less attention to agricultural development. Meanwhile, the Dutch Ministry of Agriculture, which in 2010 was merged with the Ministry of Economic Affairs, had continued its international agricultural policy, but mainly from a perspective of Dutch interests, focusing on countries in which Dutch entrepreneurs were active, and later also on countries of possible interest for Dutch entrepreneurs. For this purpose, the Ministry deployed agricultural attachés at the Dutch embassies and in certain developing countries.

Over the years preceding the policy letter of 2011[21], the policies of the Ministry of Economic Affairs, Agriculture and Innovation (EL&I) converged with the policy of the Directorate-General of International Cooperation (DGIS) under the Ministry of Foreign Affairs.

- DGIS had moved from traditional poverty reduction to sustainable economic development, in which agriculture had been recognised as an engine for growth, and for which Dutch expertise had an added value. Development aid in general had embraced a value chain approach in which the starting point was market demand.
- EL&I had moved from an initial focus on the interests of the Dutch agricultural sector, towards corporate social responsibility, in response to demands from consumers and retailers, and towards food security as a global public good. EL&I recognised the challenges and needs for international collaboration, and the opportunities for partnerships in developing countries.

In addition to the WRR report of 2010, in the period 2008-2011 three policy documents paved the way for the food security policy letter of 2011: 'Agriculture, Rural economic development, and food security', May 2008;[22] 'Outline development cooperation policy', November 2010;[23] and 'Spearheads of development policy', May 2011.[24] They describe the

[21] '*Uitwerking voedselzekerheidsbeleid*' (Ministerie van Buitenlandse Zaken and Ministerie van Economische Zaken, Landbouw en Innovatie, 2011) [EN: 'Government's policy on food security' (Ministry of Foreign Affairs and the Ministry of Economic Affairs, Agriculture and Innovation, 2011)].

[22] '*Landbouw, rurale bedrijvigheid en voedselzekerheid in ontwikkelingslanden*' (Ministerie van Buitenlandse Zaken and Ministerie van Landbouw, Natuur en Voedselkwaliteit, 2008).

[23] '*Basisbrief Ontwikkelingssamenwerking*' (Ministerie van Buitenlandse Zaken, 2010) [EN: 'Outline development cooperation policy' (Ministry of Foreign Affairs, 2010)].

[24] '*Focusbrief*' (Ministerie van Buitenlandse Zaken, 2011a) [EN: 'Spearheads of development cooperation policy' (Ministry of Foreign Affairs, 2011).

concentration of Dutch bilateral aid on fewer countries, the specialisation in fewer themes – including food security – and the greater focus on public-private partnerships involving Dutch knowledge and expertise.

The policy letter on agriculture, rural economic development, and food security (2008) was an especially important reference for the formulation of the first food security programmes (2012-2015). The five tracks presented in that policy letter were: (1) increasing agricultural productivity, (2) improving the enabling business environment, (3) developing sustainable value chains, (4) improving market access and (5) creating food security and transfer mechanisms to reach the most vulnerable.

3.1.2 Food security policy

Food security objectives

Since 2011, food security has been one of the four Dutch development policy priorities. The food security policy letter of 2011[25], drafted jointly by the Ministry of Foreign Affairs and the Ministry of Economic Affairs, distinguishes the immediate challenge of improving the situation of the current food-insecure people, and the underlying structural challenges needed to increase food availability and self-reliance in the long term. The policy considers private sector development to be an important means of achieving these objectives, especially for addressing the longer-term structural challenges for food security. The policy is constructed around four objectives: (1) increasing agricultural production, (2) improving access to nutritious food, (3) improving markets, and (4) improving the business climate. Which activities were selected for inclusion in the embassy food security portfolios depended partly on which were ongoing and whether they combined food security and private sector development objectives. The portfolio therefore often focused more on agricultural development than on improving nutrition.

The follow-up policy letter of 2014[26], also a combined effort of the two ministries, had three objectives: (1) eradicating existing hunger and malnutrition, (2) promoting inclusive and sustainable growth in the agricultural sector and (3) creating ecologically sustainable food systems. The Ministry considered knowledge management and capacity building to be a fourth, crosscutting objective contributing to all three main objectives of 2014. Compared to the letter of 2011, the letter of 2014 put more emphasis on nutrition and on environmental sustainability. The indicators proposed in the 2011 policy letter and those used in the annual result fiches for 2012-2016 to report on progress confirm the large overlap in the objectives of both policy letters. Projects that had started before 2014 were invited to report, if possible, on the sets of indicators adjusted since 2014. In 2013, the part of the original food security policy in 2011 that related to improving markets and business climate was transferred to the new

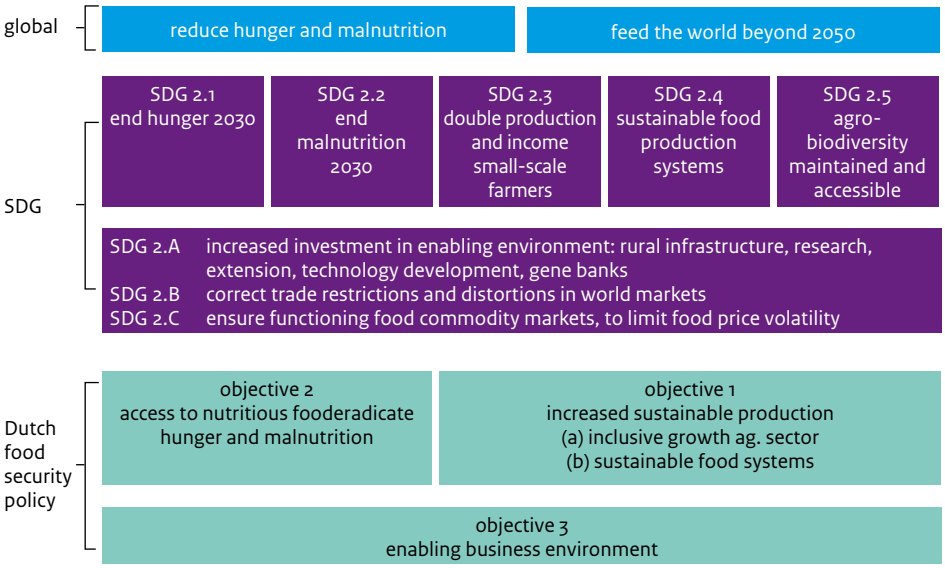
[25] '*Uitwerking voedselzekerheidsbeleid*' (Ministerie van Buitenlandse Zaken and Ministerie van Economische Zaken, Landbouw en Innovatie, 2011) [EN: 'Government's policy on food security' (Ministry of Foreign Affairs and the Ministry of Economic Affairs, Agriculture and Innovation, 2011)].

[26] '*Nederlandse inzet voor wereldwijde voedselzekerheid*' (Ministerie van Buitenlandse Zaken and Ministerie van Economische Zaken, 2014) [EN: 'The Netherlands' contribution to global food security' (Ministry of Foreign Affairs and Ministry of Economic Affairs, Agriculture and Innovation, 2014)].

private sector development policy. However, many of the embassy-managed food security portfolios still had a strong private sector development focus.

The history of the food security policy, the existing portfolio of projects at the time the policy started in 2011, and the link with private sector development explain the emphasis on agricultural development in food security policy between 2012 and 2016. Dutch food security policy is intended to contribute to the two global food security challenges: (1) the reduction of hunger and malnutrition in the short and medium term, and (2) the achievement of sustainable food systems to feed the world in the long term. The link between the three policy objectives, the elements of SDG2,[27] and the short- and long-term food security challenges is visualised in Figure 3.1 (which is based on a figure in the 2014 food security policy letter).

Figure 3.1 *Global challenges, SDG 2, and Dutch food security policy objectives*



Adding nutrition to agriculture

Nutrition was added to agricultural development in 2011, as a result of the international debate sparked by *The Lancet* series (2008) on the importance of child nutrition in the first 1,000 days, and the start of Scaling Up Nutrition (SUN) that was the result of a task force on nutrition security in which various UN organisations were involved. In the Netherlands, nutrition was added to the government's development cooperation agenda partly due to a Special Envoy on Food and Nutrition Security for Development with a nutrition and private sector background, who complemented the policy team at the Ministry of Foreign Affairs, plus a lobby group from Dutch NGOs, and a university working group on nutrition.

[27] Reducing hunger and malnutrition was also covered in the MDGs, preceding the SDG.

Nevertheless, besides the emphasis on nutrition in one of the objectives, a strong focus remained on agricultural development, supporting smallholder farmers and economic development in rural areas.

Funding channels and approaches for food security

The policy aimed at contributing to improved food security through bilateral cooperation (centrally and embassy managed) and through multilateral organisations. To support food production, the government had opted for a stronger focus on bilateral cooperation through the Dutch embassies in the 15 partner countries, and on intensive collaboration between public and private actors. Both policy letters had a strong a focus on private sector development in a broader 'Dutch diamond approach': the collaboration between governments, private sector, knowledge institutes, and civil society in order to achieve agricultural development and food security. The policy encouraged strategic use of Dutch knowledge and expertise, especially in the priority areas of the government's economic policy (Top Sectors) including agrifood, life sciences, water, horticulture and improved genetic material, all of which can contribute to increased production.

This policy aimed to use a market-driven approach with a focus on innovation and to lobby for national policies to create the favourable business climate that is a precondition for such an approach. The Dutch embassies were to ensure that there was synergy between the bilateral and multilateral channels, and between central and delegated programmes.

A joint effort of the Ministry of Foreign Affairs and the Ministry of Economic Affairs

A major contribution of the Ministry of Economic Affairs to the food security policy letter of 2011 was encouraging the use of Dutch knowledge and expertise, collaboration with private sector, and the link with the Dutch 'Top Sector Policy'[28]. This was believed to create a win-win situation: the Dutch private sector could benefit while at the same time contributing to food security in partner countries. There was good collaboration and division of labour between the two ministries. By 2016, Economic Affairs was working on four areas within the food security policy: reducing food waste; genetic resources and plant material; sustainable fisheries and aquaculture; and climate-smart agriculture. One of the topics dealt with by the Ministry of Economic Affairs is the plea for breeders' rights above patent rights. Plant breeders' rights facilitate and encourage further crop genetic development, and help safeguard biodiversity. The Ministry of Economic Affairs, Agriculture, and Innovation lobbied for such rights to be included in treaties (Nagoya protocol access and benefit sharing) and supported the Global Diversity Trust. In addition to the large DGIS budget, a much smaller budget of the Ministry of Economic Affairs, Agriculture, and Innovation is spent mainly on agricultural research and agricultural public-private partnerships in developing countries. This facilitates processes that potentially have a large impact through leveraging private sector investment.

[28] '*Naar de Top, het bedrijvenbeleid in actie(s)*'. A policy introduced by the Ministry of Economic Affairs in 2011, supporting nine economic sectors vital for the country's international competitiveness (Ministerie van Economische Zaken, Landbouw en Innovatie et al., 2011).

3.1.3 Coherence and synergy with other policies

Other development policies affect the food security policy by influencing how different policy objectives are combined and how the food security policy is implemented. Of particular importance are:

1. Private sector development;
2. Knowledge management;
3. The agenda for aid, trade and investment (as a more overarching policy since 2013).

In addition, there are links with the policies on sustainable water management, and sexual and reproductive health and rights.

Private sector development

Private sector development aims to contribute to inclusive economic growth, employment, and poverty reduction. The private sector development policy[29, 30] follows a dual approach:

1. Improving the business climate: legislation, infrastructure, financial services, capacity building, and market access and development.
2. Direct support to the private sector and public-private partnerships, to overcome constraints encountered when investing in developing countries.

According to the policy, private sector development as such combines well with the Dutch priorities of food security and water, sectors in which Dutch private sector has an added value. The premise is that support should be driven by the demand in developing countries and should result in local private sector development. To avoid potential negative effects on labour conditions or the environment, compliance with the OECD guidelines for corporate social responsibility is a prerequisite for Dutch ODA funding. Coherence between the centrally managed private sector development activities and the multi-annual strategic plans in partner countries is assured by the Dutch embassies. On the other hand, Dutch private sector and knowledge institutes have been involved in 'food security missions' to the partner countries. The trade attachés and agricultural attachés present at some of the Dutch embassies facilitate trade and investment for private sector development. The focus of the policy is on the 15 Dutch partner countries, but the private sector development instruments are also available in a further 45 countries and, to a limited extent, in some others.

Knowledge management for food security

Knowledge for development cooperation has been supported by the establishment of knowledge platforms for the Dutch policy priorities in development cooperation, bridging knowledge institutes and the Ministry of Foreign Affairs. The policy letter[31] lists the following main recipients and activities for food security:

- The Food and Business Knowledge Platform (F&BKP). Through a multi-stakeholder process, it collaboratively formulates research questions, sets a research agenda, makes overviews of available knowledge and feeds research results back to policy and practice.

[29] '*Ontwikkeling door duurzaam ondernemen*' (Ministerie van Buitenlandse Zaken, 2011b).
[30] '*Ondernemen voor ontwikkeling*' (Ministerie van Buitenlandse Zaken, 2013a).
[31] '*Kennisbeleid en samenwerking met kennisinstituten op het terrein van ontwikkelingssamenwerking*' (Ministerie van Buitenlandse Zaken, 2011c).

The platform manages two research funds: the Applied Research Fund (ARF) and the Global Challenge Programme (GCP), both of which are under the aegis of NWO-WOTRO Science for Global Development.
- The Dutch Organisation for Internationalisation of Education (NUFFIC) builds capacity of Southern students at Dutch universities.
- The Consultative Group of International Agricultural Research (CGIAR) receives funds for agricultural research.
- The Young Expert Programme funds young professionals in international organisations working on food security
- The Centre for World Food Studies (SOW-VU) does research on global food security issues (and is due to be transformed into a Centre of Excellence).

The agenda for aid, trade, and investment

The aid, trade, and investment agenda has been the broader vision of the Minister of Foreign Trade and Development Cooperation since 2013.[32] It has its roots in the 2010 WRR report '*Less pretention, more ambition*' that recommended: (a) a shift from giving aid to social sectors towards investing in productive sectors such as food security and water, for longer-term results and self-reliance; (b) focusing on global public goods that also affect the Netherlands; and (c) working in partnerships between government, NGOs, and the private sector. The policy formulates three main objectives that combine solidarity with self-interest:

1. Eradication of extreme poverty in one generation.
2. Sustainable inclusive growth.
3. Success for Dutch companies abroad.

Food security is one of the specific themes under Objective 1 and matches well with Objective 2 and the PSD agenda; Objective 3 has implications for the design and choice of partners for implementing food security activities. For the food security programme in the 15 partner countries, there is an important distinction between countries with an aid relationship and countries with a transitional (from aid to trade) relationship:

1. Aid relationships: post-conflict countries, fragile states and countries with insufficient capacity to reduce poverty without assistance: Afghanistan, Burundi, Mali, Palestinian Territories, Rwanda, South Sudan, and Yemen. Where possible, a regional approach: Great Lakes, Horn of Africa.
2. Transitional relationships: low- and middle-income countries. These may benefit from poverty reduction programmes and from increased market access and an improved business climate: Bangladesh, Benin, Ethiopia, Ghana, Indonesia, Kenya, Mozambique, and Uganda. In other middle-income countries, the Netherlands can provide support through private sector development programmes, economic diplomacy, and through EU and multilateral organisations.

[32] '*Wat de wereld verdient: Een nieuwe agenda voor hulp, handel en investeringen*' (Ministerie van Buitenlandse Zaken, 2013b) [EN: 'A world to Gain: a new agenda for aid, trade and investment' (Ministry of Foreign Affairs, 2013)].

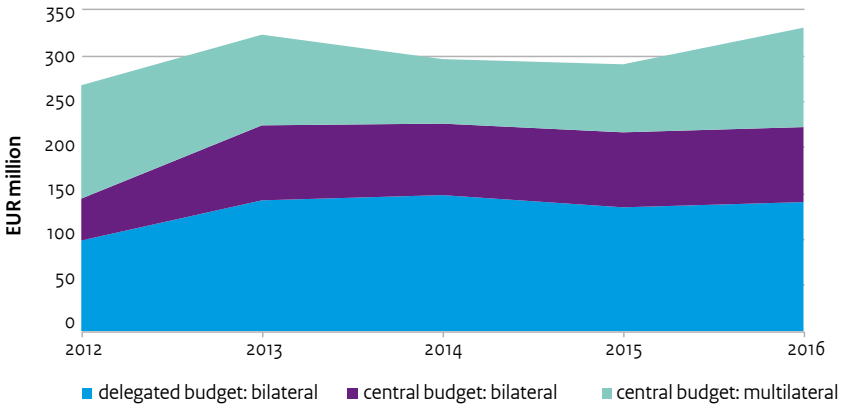
3.2 Policy expenditure and instruments

3.2.1 Expenditures in partner countries

Between 2012 and 2016 the Ministry of Foreign Affairs spent a total of EUR 1.5 billion on operational objective 2.1 'Increased Food Security'.[33] This is about 10% of the total ODA expenditures of the Netherlands in this period.

During the period 2012-2016, annual expenditure on food security was stable, at around EUR 300 million per year (Figure 3.2). About two-thirds (68%) of the total budget was disbursed through the bilateral channel and about one-third (31%) through the multilateral channel.[34, 35] About 44% of the budget (65% of what is channelled bilaterally) was delegated to embassies. The remainder was financed centrally from The Hague.

Figure 3.2 *Annual expenditure by the Dutch government on operational objective 2.1 'Increasing Food Security', 2012-2016*



Thirteen of the fifteen Dutch partner countries had a food security budget (the exceptions were Afghanistan and Yemen). Although centrally funded activities are not earmarked geographically, an internal review of country portfolios (in 2015-2016) showed that a large

[33] Figures on expenditure were obtained from the financial database of the Ministry ('Piramide') on 9 December 2016. Included are all expenditures under budget categories (SBE) 0610S13, 0810S00 (only 2013 and 2014), 0811S00 (only 2013 and 2014), 0812S00, 1987S00, 1990S00, 1991S00, 1995S00 and 7011S00. Note this is different from the budget reported in annual report and the DGIS information system.

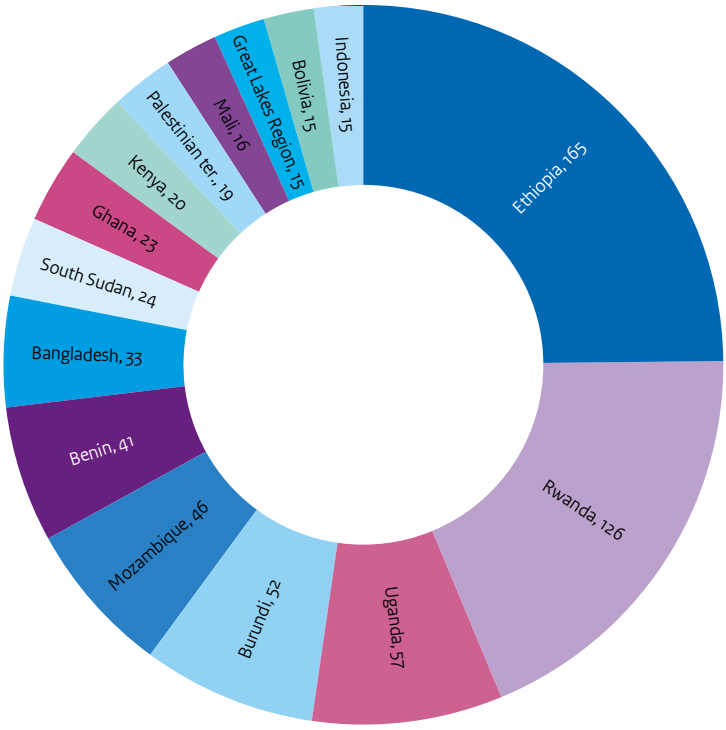
[34] The bilateral channel is defined as a finance stream from the Netherlands directly to one or more countries. This includes all delegated programmes. Bilateral programmes may, however, be implemented by a multilateral organisation (e.g. FAO, IFAD, UNICEF). The multilateral channel is defined as central financing to an international organisation, fund, or project that also receives funding from other donors and channels it to one or more countries.

[35] About 0.6% of the budget was not spent through the multilateral or bilateral channels but instead remained in the Netherlands (used, e.g., for conferences).

share of this budget was also channelled to the Dutch partner countries. The geographical spread of the delegated budget is illustrated by Figure 3.3.

In the period reviewed, Ethiopia had the largest food security programme (in terms of funding from the Dutch government): on average EUR 33 million per year, or about 25% of the entire delegated budget. Not far behind was Rwanda, with disbursements of about EUR 25 million per year (19 % of the delegated budget). The large programmes in Uganda, Burundi, and Mozambique plus the smaller programmes in South Sudan, Kenya and the Great Lakes region (which includes the Democratic Republic of Congo, Rwanda and Burundi) mean that Eastern Africa received more than three-quarters (76%) of the delegated budget. The rest went to Mali, Benin, and Ghana in Western Africa (11%) and Palestine, Bangladesh, and Indonesia in Asia (10%). A small share of the budget (2.4%) was spent in the ex-partner countries of Bolivia, Nicaragua, and Suriname in 2012 and 2013.[36] This choice is relevant from a food security point of view: except for Ghana, all partner countries are in the group with high levels of child malnutrition. The largest share of total expenditure was spent in countries with both high levels of child malnutrition and high levels of undernourishment (see Chapter 7 for details).

Figure 3.3 *The delegated food security budget of the Netherlands: expenditures 2012-2016 by country (in EUR million)*

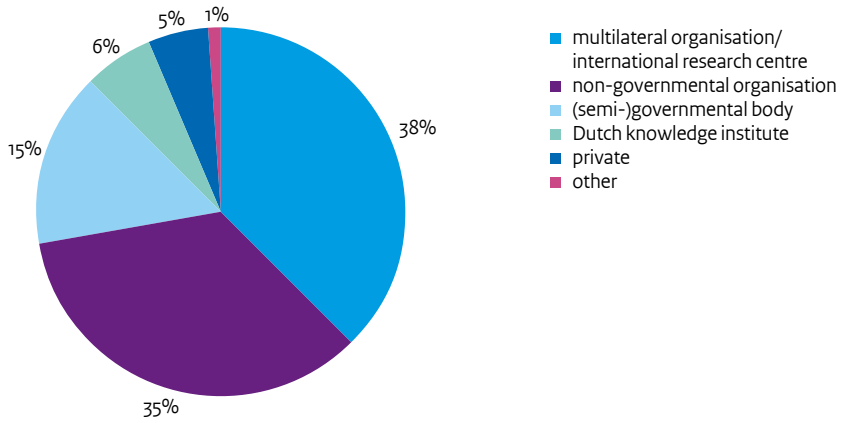


[36] Nicaragua (EUR 1.2 million) and Suriname (EUR 0.4 million) are not represented in the figure because of the small expenditures.

3.2.2 Expenditure by implementing organisation

Most of the expenditure was on activities implemented by multilateral organisations or international research centres (38%) and NGOs (35%). Governmental bodies (e.g. ministries or semi-governmental agencies) took on about 15% of the disbursement (Figure 3.4). The remainder went to the private sector (e.g. consultancies, banks, or private actors within public-private partnerships) or to Dutch knowledge institutes (Wageningen University and Research in particular).

Figure 3.4 *Implementation agents of Dutch food security policy 2012-2016*



Source: Estimates based on analysis of 207 out of 249 available activity appraisal documents weighted by budget size and by the number of co-implementers. [37]

3.2.3 Expenditure by policy objective and impact pathway

In terms of expenditure, from 2012-2016 the emphasis of the Dutch food security policy was on Objective 1 'More sustainable food production' (Figure 3.5). About EUR 833 million (56% of the total budget) was spent on activities primarily intended to improve farm production, ecological sustainability, and incomes of rural households.[38] A more modest share was allocated to Objective 2 'Better access to nutritious food', with about EUR 177 million (12%) spent on programmes such as social safety nets, micronutrient supplementation and fortification, and nutritional awareness and behaviour. Finally, about EUR 483 million (32%) was spent on activities that primarily contributed to Objective 3 'Enabling business environment'. The activities associated with this objective are intended to improve the

[37] One third of the budget for activities implemented by public-private partnerships has been assumed to have been disbursed to implementing agencies in the private sector.

[38] Based on its activity appraisal document, each activity was allocated to a single objective, chosen in light of the project's main emphasis. Note that activities might also contribute to other policy objectives.

enabling business environment (and indirectly contribute to Objectives 1 and 2) through policy dialogue, capacity building, infrastructural investments, agribusiness development, the strengthening of farmer organisations and multi-stakeholder platforms, etc.

Figure 3.5 *Total expenditures (2012-2016) allocated to each policy objective*

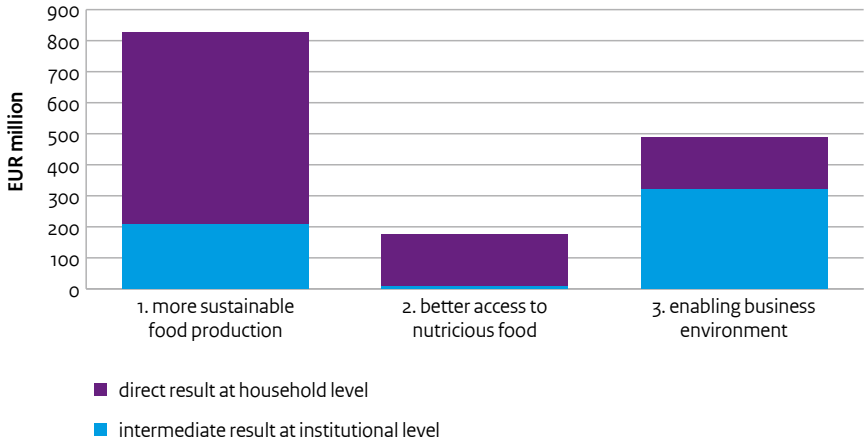


Figure 3.5 also shows the proportion of expenditure allocated to activities intended to directly contribute to results at household or farm level, and the proportion spent on activities that contribute to intermediate results, often at institutional level, necessary to enable food security to be improved in the medium and long term. As can be expected, most of the activities that primarily contribute to Objectives 1 and 2 are intended to achieve results at household or individual level, while most of the activities under Objective 3 are intended to achieve intermediate results at institutional level. Activities contributing to intermediate results include support to agricultural research, infrastructural investments, natural resource management, policy dialogue, and capacity building of farmer, public or private organisations.

Finally, we looked at the types of activities funded by the Netherlands. We categorised these activities based on the main *impact pathway* (or intervention logic) used by the activity to achieve the policy objective. One pathway follows a common logic for a group of similar projects and allows us to describe how policy was implemented, how objectives were intended to be achieved and what assumptions were made (see Chapters 4, 5, and 6). Table 3.1 shows the expenditure per impact pathway. Note that these impact pathways are not part of the policy, are an abstraction of the complex realities on the ground, and may not perfectly fit the underlying activities in every aspect. Although it is possible for one project to work along more than one pathway, the predominant pathway can usually be identified.

Table 3.1 Expenditures (2012-2016), in EUR million and as percentage of total food security expenditure, allocated to different impact pathways		
Objective 1: More Sustainable Food Production	**841**	**56%**
Impact Pathway 1: Agricultural Research	187	12%
Impact Pathway 2: Public Farmer Training and Information Services	46	5%
Impact Pathway 3: Value Chain Development	417	28%
Impact Pathway 4: Natural Resource Management for agriculture	57	4%
Multipurpose Funds (e.g. IFAD)	132	9%
Objective 2: Better Access to Nutritious Food	**173**	**12%**
Impact Pathway 5: Social Safety Nets/ Transfer of food or cash	84	6%
Impact Pathway 6: Food Fortification	33	2%
Impact Pathway 7: Nutritional knowledge, awareness and behaviour	55	4%
Objective 3: Enabling business environment	**486**	**32%**
Impact Pathway 8: Land Rights	51	3%
Impact Pathway 9: Infrastructure (incl. finance)	136	9%
Impact Pathway 10: Capacity Development (discussion focuses on farmer organisations)	116	8%
Impact Pathway 11: Private and public policy dialogue	50	3%
Education and Training (not further discussed in this evaluation)	135	9%

3.2.4 Expenditure from other budget articles contributing to food security

So far, we have presented the expenditure from the food security budget (Budget Article 2.1), which is the scope and delimitation of this policy review. This does not include the expenditures allocated to other budget articles that also contribute to food security, including:

a. A Stronger Private Sector and an Improved Investment Climate and the Dutch Good Growth Fund, e.g. via employment creation and higher (and stable) non-farm income for food insecure families;
b. Improved Water Management, Drinking Water and Sanitation, e.g. via water security for agriculture and an increase in agricultural production, or via clean drinking water and sanitation that can improve a person's health status and ability to metabolise nutrients;
c. Sustainable use of Natural Resources and Climate Change, e.g. via future food availability or via household resilience against shocks;
d. Sexual and Reproductive Health and Rights, e.g. via family planning that slows population growth and consequently reduces global food demand;
e. Equal Rights and Opportunities for Women, e.g. via intra-household bargaining power for women and improved dietary intake;
f. A Stronger Civil Society (MFS2, SNV) via various food security projects;
g. Humanitarian Aid (e.g. the World Food Programme), e.g. via emergency food aid; and
h. Greater Multilateral Involvement (e.g. UNDP, UNICEF), e.g. via direct nutrient supplementation for children.

The total budget allocated to these food security activities funded from other budget articles is estimated to be EUR 2.6 billion[39] (2012-2016). Adding this sum to the food security budget yields a total of EUR 4.1 billion spent on food security activities; this is 27% of total Dutch ODA. In the remainder of this section we will focus solely on the expenditures allocated to Budget Article 2.1 (food security), because the other expenditures have been accounted for by other policy reviews.

3.3 Food security ambition and reach in terms of number of beneficiaries and land area covered

SDG 2 and the Dutch 'fair share' contribution

Sustainable Development Goal 2 aims to end hunger (790 million people) and all forms of malnutrition (2 billion people) by 2030. It also commits to achieving universal access to safe, nutritious, and sufficient food at all times of the year. This will require sustainable food production systems and resilient agricultural practices, equitable access to land, technology and markets, and international cooperation on investments in infrastructure and technology to boost agricultural productivity (500 million smallholder farmers, cultivating about 475 million ha land).

In 2014, the Dutch Ministry of Foreign Affairs calculated its 'fair share commitment', based on its share of global resources (1.6%) and the SDG 2 ambitions. The ambition of the Netherlands is to help lift 32 million malnourished people out of undernourishment, to support 8 million smallholder farm families in doubling their productivity and/or income, and to help convert 7.5 million ha of smallholder farmland to sustainable use, by 2030.The achievements are reported yearly in terms of number of beneficiaries with an unquantified but substantial improvement in food intake, agricultural production, and income, and in terms of the sustainability of the farmers' land management.

Annual monitoring of results

Since 2014, the Ministry has aggregated results across projects for a limited number of indicators, to give an impression of the reach of the food security programme in terms of:

a) the number of beneficiaries that have improved their food intake;
b) the number of farmers that have increased their agricultural production and / or income;
c) the land area (ha) under eco-efficient management.

[39] This figure was obtained from the Ministry of Foreign Affairs' Management Intelligence System ('Dashboard') on 21 December 2016. Included are those expenditures not allocated to operational objective 2.1 but that assigned either the policy code 'VdsZek' (food security) by a policy officer, or were assigned a CRS code related to food security (i12240, 311xx, 312xx, 313xx, 232161, 43040, 52010 or 72040), or were multilateral contributions to IFAD, WFP, FAO, UNDP, or UNFPA.

The results for 2014 show only the total reach in terms of number of people, farmers, or hectares of farmland, without indicating the effect size. The results in 2015 and 2016 show the total reach, plus the reach in terms of people, farmers and hectares of farmland on which the projects have had a substantial but unquantified effect. The challenge is to also capture the magnitude of the effect and relate it to the ambitions for 2030. There is a trade-off between a reach and effect size, and the challenge is to find the right balance between the two in order to achieve the 2030 ambitions. Ultimately, the Ministry of Foreign Affairs would like to monitor the reach in terms of people that have moved out of undernourishment, farmers that have doubled their production and / or income, and hectares of farmland that are under a sufficient degree of eco-efficient management, reflecting the SDG ambitions.

These annual results can be compared with the targets the Ministry has set for its reach by 2030. Note that figures of different years cannot be added up: some of the farmers supported in 2015 were also supported in 2014.

Table 3.2 Aggregated food security results for 2014, 2015, and 2016 (million people reached per year)

NL fair share of SDG ambition by 2030	Annual results (million people)			
		2014	2015	2016
32 million People out of undernourishment	reach	7.9	18.1	33.7
	reach + effect		10.3	15.5
8 million Farmers doubling production and / or income	reach	4.5	7.1	7.4
	reach + effect		1.7	1.9
7.5 million Ha farm land managed eco-efficiently	reach	1.4	2.4	1.4
	reach + effect		0.6	0.4

4

Contribution to increased agricultural production and sustainability

4.1 Introduction

Chapter 3 discerned three main objectives of the Dutch food security policy: (1) increased sustainable agricultural production, (2) increased access to nutritious food, and (3) improved enabling business environment. To achieve these objectives, the Ministry of Foreign Affairs has supported large number of projects. We have grouped all these activities into 11 pathways (groups of similar projects). This chapter discusses the effectiveness of the pathways that contribute to the first objective. Chapters 5 and 6 will elaborate on the contribution of the pathways that (mainly) contribute to the second and third objectives.

This chapter starts by describing the policy objective and the contributing impact pathways, the available evaluations, and the main conclusions. Each pathway is then described in more detail in a separate section, following the result chain and with evidence drawn from evaluations and broader literature. Finally, conclusions are drawn about how the different pathways compare and their contribution to the policy objective.

In this chapter, we analyse the effectiveness of contributions of the Ministry to the first policy objective 'increased sustainable farm production', which aims to increase smallholder farm production and income in an environmentally sustainable way. This policy objective combines the short-term objectives to reduce poverty among smallholder farmers, increase food availability, and create off-farm employment in the agricultural sector, with the long-term objective of creating sustainable food production systems that are resilient to climate change. Four impact pathways contribute to this policy objective: (1) agricultural research, (2) farmer training and information services, (3) value chain development, and (4) natural resource management for agricultural production.

The main finding of this chapter is that although many projects under the policy objective 'increased sustainable production' have indeed increased farm production and income, their impact on sustainability is often unknown. The literature reviewed contains convincing evidence that agricultural research and farmer extension contribute to farm production and income. Evaluations of value chain development show mixed results, from very positive to no effect, depending on the design and implementation of the project. Natural resource management, especially the management of water in agriculture, has positively affected production and income, but little is known about its effect on environmental sustainability

4.2 Pathways contributing to increased sustainable farm production

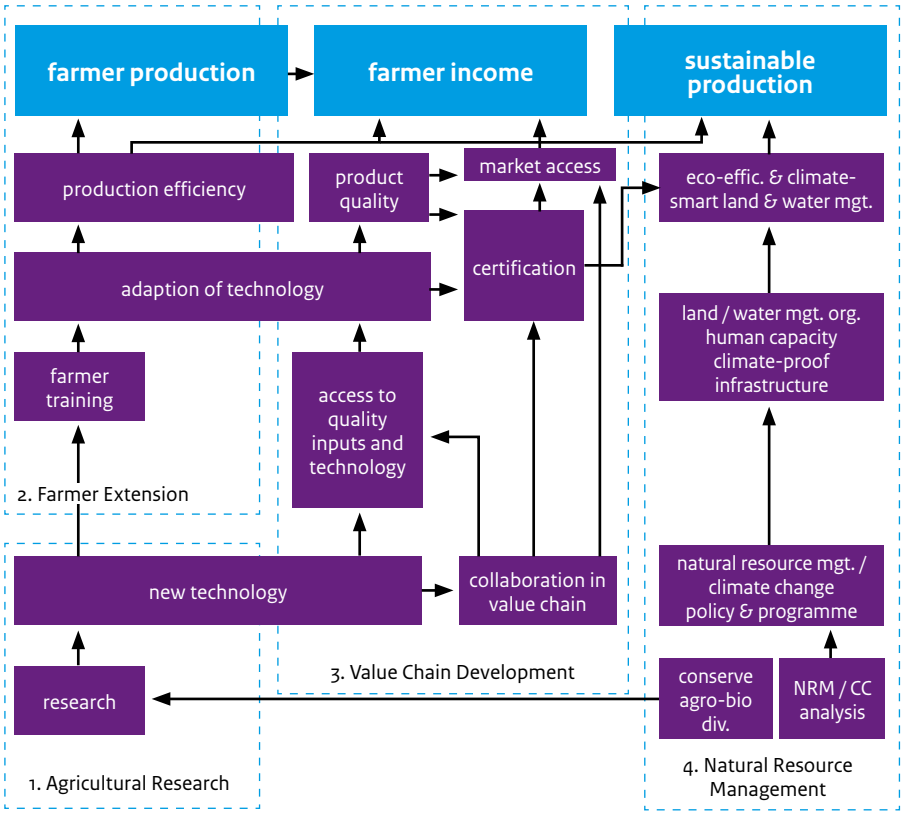
Each of the four pathways has its own result chain that contributes to increased farm production, income, and sustainability (see Figure 4.1). The first three pathways are interlinked, the fourth less so. Agricultural research (pathway 1) develops new technologies (e.g. new seed varieties or post-harvest practices), which are taken up by farmer extension services (pathway 2) or by the private sector (e.g. farm input companies). Farmer adoption

of new technologies improves production efficiency, farm production, and income, and in some cases results in more sustainable production.

Value chain development (pathway 3) also facilitates farmer access to new technologies. In the case of *input value chain development* this happens directly: by projects collaborating with companies or cooperatives that provide farm inputs and services. In the case of *value chain development through lead firms* this happens via product and production standards to assure product quality or sustainability. The projects following this impact pathway often involve public-private partnerships that include farmer training, certification, and the provision of farm inputs as part of contract farming schemes. The assumption underlying this pathway is that by complying with these product and production standards farmers can improve their product quality, increase their market access, and consequently obtain a higher price for their produce. The adoption of technology and the improved market access are expected to result in farmers increasing food production and their income in a sustainable way.

Natural resource management for sustainable agriculture (pathway 4) includes the conservation of genetic resources and their availability for future research. It also includes the analysis of sustainability issues in agriculture that inform policies and programmes. This can result in eco-efficient management of land and water and contribute to sustainable agricultural production through land and water management organisations, improved human capacity (e.g. for resilience to climate change), and climate-proof infrastructure.

Figure 4.1 *The pathways contributing to 'increased sustainable production': agricultural research, farmer extension, value chain development, and natural resource management*



In terms of expenditure, the most important ways through which the Netherlands has aimed to contribute to increased food production (and higher farmer incomes) during the review period were value chain development (EUR 417 million)[40] and agricultural research (EUR 187 million). The more traditional farmer extension and public information services were still important but predominantly as part of value chain development projects and less as stand-alone activities (EUR 45 million). Natural resource management for agricultural production has received less attention (EUR 59 million). The final category under this objective comprises the financial contribution to a number of multipurpose activities, such as the support to IFAD and a number of innovation funds that may operate via multiple pathways (EUR 132 million). IFAD programmes, for example, provide farmers with training, develop local value chains, build infrastructure, and contribute to natural resource management.

[40] Unless otherwise indicated, all sums in parentheses refer to expenditure during the review period 2012-2016.

To evaluate the effectiveness of interventions of the Ministry that contribute to this policy objective we used 30 evaluations, divided over the 4 pathways, covering 60% of the total expenditures in the period 2012 to 2016 (see Table 4.1). We also drew on the ample evidence from the broader scientific and grey literature (see the discussions of the individual impact pathways).

Table 4.1 Evaluation coverage (expenditure on evaluated projects / expenditure on all projects) and evaluation quality (policy objective 1)

	Projects total		Projects evaluated			Eval. Quality**				Eval. Type***		
Pathway	No.	EUR million	No.	EUR million	cover	C1	C2	C3	C4	MTR	Eval	IOB
1. Agricultural research	8	187.2	1	150.0	80%	1	0	0	0	0	1	0
2. Farmer extension	8	45.8	4	37.8	82%	0	0	3	1	3	1	0
3. Value chain development	51	417.3	19	150.0	36%	4	1	4	10	11	5	3
4. NRM* for agricultural production	9	58.6	2	41.4	71%	0	0	0	2	1	1	0
Multipurpose	8	132.2	4	126.5	97%	1	0	3	0	3	1	0
Total	**84**	**841.2**	**30**	**505.7**	**60%**	**6**	**1**	**10**	**13**	**18**	**9**	**3**

** NRM = natural resource management.*
*** Quality of evaluation: Category 1 is best (see Chapter 2).*
**** Type of evaluation: MTR (mid-term review), Eval (evaluation), IOB (IOB impact study).*

4.3 Agricultural research (pathway 1)

The first pathway that contributes to higher sustainable food production is agricultural research. The activities in this pathway are generally *enabling* in nature as they do not directly affect farm-level production. Instead, they generate knowledge and develop technologies that can be used by policymakers, the private sector, project implementers, governmental and semi-governmental agencies (e.g. extension offices), and farmers. Ultimately, the enhanced knowledge should result in better public and private policies, higher agricultural production, and increased food security.

The Netherlands mainly contributed to agricultural research by knowledge creation in two ways. First, it contributed to more fundamental, longer-trajectory knowledge creation, mainly by the support it has given to the CGIAR (EUR 150 million). CGIAR is a partnership of fifteen international research institutes (e.g. IFPRI, CIAT, ILRI, CIP, CIFOR) that focus on reducing poverty, enhancing food and nutritional security, and improving natural resources and ecosystem services. Examples of outputs of fundamental research are new crop varieties, livestock breeds and management practices, feed development and conceptual frameworks, and empirical evidence for policymaking.

Secondly, the Netherlands contributed to generating more applied knowledge in shorter research trajectories, by supporting projects that apply innovative technologies or approaches (some of which are based on fundamental research). An example is the support given to the **ARF** (EUR 6.4 million), managed by the Netherlands Organisation for Scientific Research (NWO), which used research insights to develop and test innovations in a local context. The goal of this project is for the insights and experiences gained to result in new products, services, or policies. Another example of applied research is the support to **CASCAPE** (EUR 10.1 million) implemented with the support of Wageningen University and Research in Ethiopia. This project focused on identifying, documenting, integrating, and disseminating best practices in agricultural production and marketing by testing innovations in the local context. Such projects test practices that are expected to be scaled-up by the national Agricultural Growth Programme (see pathway 2).[41]

Evidence

The evaluation of CGIAR (Birner and Byerlee, 2016) is the only independent evaluation available for the activities following this pathway. It is difficult to evaluate the effectiveness of agricultural research because of the time lag between the start of the research process and the full-scale adoption of an innovation.[42] This implies that the CGIAR results presented in this recent report is based on research that started before 2012. Most of the rigorous impact assessments conducted on CGIAR research focuses on the development of improved crop varieties, fish strains, and to a smaller extent, livestock breeds. The most recent large-scale study on the adoption of modern varieties in sub-Saharan Africa (Walker et al., 2014) shows that for most crops there has been progress in farmer uptake of modern varieties and attributes the introduction of these modern varieties to the CGIAR research programmes. The authors estimate that in 2010, modern varieties accounted for 35% of the total area of food crops in sub-Saharan Africa, compared with 25% in 1998. Importantly, about two-thirds of the modern varieties used in 2010 can be related to CGIAR research activities.

This diffusion of modern varieties is estimated to have resulted in a 15% increase in total crop productivity for sub-Saharan Africa alone (Fuglie and Marder, 2015). This amounts to about an additional value of USD 6 billion per year.

Other evidence shows that the introduction of modern varieties can have a major impact on poverty and food security. The introduction of improved maize varieties in Ethiopia, for example, is estimated to have reduced the rural poverty rate by 0.8 - 1.3% (Zeng et al., 2015). The introduction of improved bean varieties by CGIAR has helped an estimated 16% of the

[41] Projects highlighted here have knowledge creation and dissemination as an explicit objective. However, many other programmes funded by the Netherlands also apply innovative approaches and communicate lessons learned to local and international stakeholders even though this is not explicitly stated to be a strategy (see the discussion on the aid architecture in Chapter 9).

[42] A study in sub-Saharan Africa, for example, found that the improved seed varieties used by farmers were, on average, released 14 years ago (Walker et al. 2014).

households in Rwanda and 2% of the households in Uganda become food-secure (Larochelle et al., 2015).[43]

The effects of other, less tangible research outputs generated by CGIAR are generally also evaluated positively (although the evidence remains more anecdotal). IFPRI, for example, which primarily produces policy recommendations, has had a substantial impact on the world's poor, according to a recent report that synthesised existing evaluations (Hazell and Slade, 2017).[44]

Older evaluations and meta-analyses of agricultural research show that the largest benefits in terms of adoption and production have been achieved for the main staple food crops in Asia and Latin America, where conditions are more favourable in terms of government support, extension services, markets, irrigation, and access to other inputs (Evenson and Gollin, 2003; Hazell, 2009; Maredia and Raitzer, 2006; Raitzer and Kelley, 2008). Benefits in Africa have lagged behind, due to the more diverse and complex agro-ecological context and less favourable farm environment (access to markets, technology, capital) in Africa. However, the application of research findings to reduce losses of crop and livestock production has also been beneficial in Africa (Dubin and Brennan, 2009; Kassie et al., 2011; Maredia and Raitzer, 2006; Roeder and Rich, 2009; Zeddies et al., 2001).

To conclude, the CGIAR research programme is cost-effective. The evidence suggests that a small number of successful innovations can have a significant effect on food production, poverty, and food security in the world, and can largely outweigh the research costs.[45]

4.4 Public farmer training and information services (pathway 2)

A straightforward way to achieve higher and more sustainable agricultural production is to assist farmers in changing the production technology they use to produce food. Many activities supported by the Netherlands intended to do this by providing farmers with agricultural extension services and by providing training. Training interventions come in many different forms and varieties. Whereas interventions used to be mostly top–down and transferred knowledge generated at research stations, the current trend is for more participatory approaches that focus on priorities identified by the farmers themselves and use experiential learning (Waddington et al., 2014).

43 Households in Uganda had more diversity in dietary intake than Rwandan households before the introduction of the improved variety. This might account for some of the difference in effects.

44 They base their analysis on a number of case studies that were able to quantify the effect of IFPRI at a country level. Renkow and Slade (2013), for example, argue that the welfare benefits that have accrued to participants in the Productive Safety Net Program (see pathway 5) as a result of IFPRI's research activities are sufficiently large to cover the total expenditures of IFPRI in Ethiopia.

45 According to the CGIAR Annual Report 2015 'Change in the Making' (2016), the yearly total expenditure lies around USD 1 billion. A meta-analysis estimated the CGIAR investment 1960-2001 benefit-costs ratio at between 1.9 (proven) and 4.8 (plausible), without extrapolating to continued benefits in the future (Raitzer and Kelley, 2008).

An example is the support to the Ethiopia **Agricultural Growth Programme** (AGP: EUR 29 million) implemented by the Ethiopian Ministry of Agriculture, which includes a large public farmer extension component. An important component of the programme is the strengthening of the national extension services through which farmers are trained. Other examples can be found among the many value chain development interventions in which providing information and training is often a key component, such as the training on integrated soil fertility management offered by a number of IFDC programmes supported by the Netherlands (see pathway 3).

The general logic of pathway 2 is that through the intervention farmers gain knowledge and skills, which they then apply to their production process (changing the technology they use). This should lead to more efficient production (improved productivity of land, labour, water, and farm inputs), higher total production, and, finally, a higher total household income. A general assumption underlying the design of many of the projects following this pathway is that the knowledge is shared between participants and neighbouring non-participants.

Evidence

To evaluate the effectiveness of projects following this pathway in terms of their contribution to farm production and income, one final evaluation and three mid-term reviews were available for four Dutch-funded projects with agricultural extension as their major impact pathway: the *AGP* in Ethiopia (Mid-term review mission, 2014), *High-value crops* in the Palestinian Territories (Brand et al., 2015b), *Farmer use of research results* in Benin (David and Agbodjogbe, 2015), and the support to *CABI Plantwise* (Evidence on Demand, 2015). The mid-term review of AGP is the only evaluation that compares the baseline situation with the mid-term situation and districts targeted with control districts. The results of this mid-term review confirm that an evaluation not considering a control group or not considering a before–after comparison risks drawing biased conclusions.

All four projects are institutionally embedded, either in government agricultural programmes, farmer organisations, or extension services, with three projects also having links to research. The number of farmers having adopted new practices is still modest, even given that three projects were only halfway through their project period. For example, although AGP aims to benefit the total population of 2 million farmers in the targeted districts, at the time of the evaluation it had provided extension services to about half a million farmers, of whom only 25,000 farmers had adopted a new practice by the halfway stage of the project. The evaluation expressed doubts about the extension–farmers interface. For AGP, the mid-term review was too early to measure an effect on crop yield or marketed crop value; field activities had only started 1 to 2 years previously. The other evaluations were more positive about the effects, but shortcomings in their set-up made firm conclusions impossible. The effects of public extension in the AGP in Ethiopia are likely to benefit from the relatively strong and capable government – a condition that may not be met in many other countries.

Table 4.2 Description of projects and their main results as reported in the evaluations consulted

Project, country	Budget (EUR million)	Period	Brief description	Institutional outcomes	Adoption of practices
AGP, Ethiopia	NL 30 Total 243	2011-2015	Extension to smallholder farmers: Training days, extension visits, demonstrations.[46]	+ Multi-donor trust fund working on govt. programme. + Link to research and innovation project, e.g. CASCAPE.	24,653 households had adopted best practices (2013).
High Value Crops, Palestinian Territories.	7.1	2012-2018	Good agricultural practices, high-value crops, certification, marketing.	+ Service delivery by cooperatives: plausible, but limited: Plausible - Policy implementation: Unlikely	+ Farm Practices: Plausible ++ Certification: Proven
CABI Plantwise, Worldwide	5.0	2013-2017	Support local plant clinics: link farmer demand through extension service to technical expertise. Reduce plant diseases and crop losses.	+ 398 Plant clinics. Trained plant doctors and knowledge dissemination to farmers: proven	+ farmers access information: Plausible
Farmer use of research results, Benin	1.4	2012-2017	Extension, demo plots, leaflets, radio	+ Farmer organisation capable of disseminating research results. Linked to other institutions, incl. SNV, WUR.	+ 2100 HH had adopted inoculated soya, rice steaming or improved feed: Plausible

HH = households.

A systematic review of the effectiveness of farm extension through farmer field schools was generally positive. The farmer participants gain knowledge, adopt new practices, and increase crop yields (on average, +13%) and profits per unit of land (+19%) (Waddington et al., 2014). The evidence comes from smaller-scale, intensively supported farmer field schools. Larger, national farmer field school programmes that run for a longer time were found to be ineffective, partly because the participatory approach had not yet been taken up fully by the national extension services. The greatest impact on farm income was found for projects that combined farmer training with input and output value chain interventions.

A systematic review of farmer training and the introduction of innovations (Stewart et al., 2015) found positive effects on crop harvest value (+12%) and nutritional intake (+32% vitamin A) from the introduction of orange-fleshed sweet potato, but no effects of the

[46] The agricultural growth programme also includes infrastructural investments (roads and irrigation), support to cooperatives, and value chain development.

training intervention itself. The review found it difficult to disentangle the effect of the extension method from the effect of the innovation.

In all four projects, the target group is not the poorest farmers. The AGP in Ethiopia targets high-potential, food surplus districts. However, within these districts there are food-insecure households, as evidenced by the high incidence of child stunting. The project explicitly targets women and youth, but women's participation has remained below expectations. In Benin and the Palestinian territories, it is likely that poorer, food-insecure farmers have also benefited, albeit to a limited extent. The CABI evaluation acknowledges that the more innovative farmers benefit.

The systematic reviews confirm that farm extension programmes and projects in general target better-off farmers. Those that targeted poorer farmers or women were not always successful in reaching them, mainly because the extension method (e.g. longer sessions away from home) made it more difficult for them to participate. Participatory FFS seems more effective than top–down delivery methods. An important lesson is that there is no significant effect beyond the direct beneficiaries of farmer training and extension. It cannot be assumed that non-participating neighbouring farmers will copy the new practices.

In conclusion, projects supported by the Netherlands that have used public farmer extension have had positive, albeit modest, effects on the adoption of new farm technologies, but have primarily reached the better-off farmers. It must be noted, however, that most evaluations were not very rigorous. The available broader literature shows that, on average, farm extension also leads to increased crop yields and higher farm income and that effects were stronger when farmer training was small-scale and intensive, whereas income effects were stronger when extension was combined with value chain development (see next section).

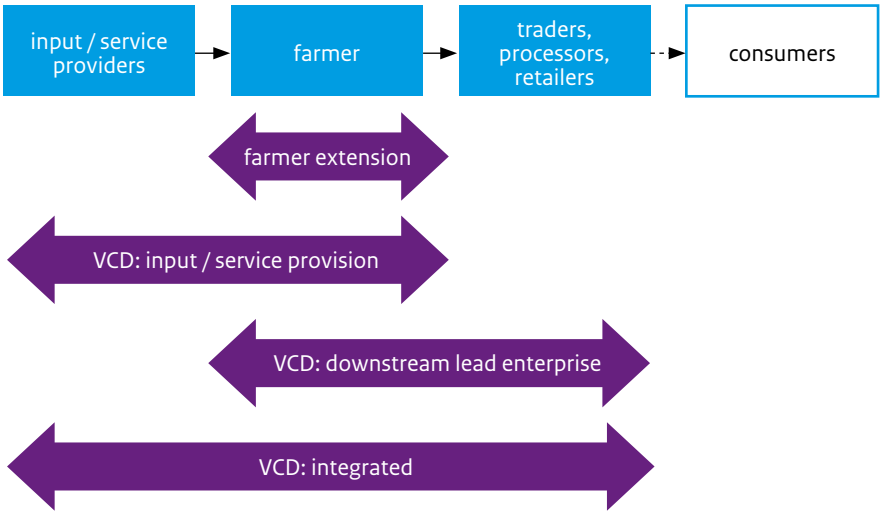
4.5 Value chain development (pathway 3)

Whereas farmer extension (pathway 2) focuses on the farmer, many of the interventions supported by the Netherlands take a more systematic approach by looking at the value chain in which the farmer operates. Just as in pathway 2, in pathway 3 it is the farmer who is generally the final beneficiary in these types of interventions. However, instead of supporting the farmer directly, these activities mainly support other commercial actors in the farmer's value chain and partner with them. These actors may be providers of inputs (e.g. seeds, fertiliser, information, insurance) or buyers of produce, such as traders, processors, or retailers. The central assumption is that supporting key actors in the value chain can have positive spill-over effects on agricultural production, farmer incomes, employment, and, in some cases, consumer access to nutritious food. Consumers are rarely involved in value chain development.

We distinguish three types of value chain development (VCD in Figure 4.2) interventions, each of which focuses on a different part of the value chain: Input and Services Value Chain

Development (EUR 66 million), Value Chain Development by financing lead firms (EUR 180 million), and Integrated Value Chain Development (EUR 170 million).

Figure 4.2 *Different approaches for agricultural value chain development*



VCD = value chain development.

4.5.1 Value chain development by financing lead firms (pathway 3a)

An important way the Netherlands facilitates value chain transformation is by partnering with lead firms (traders, processors, retailers) and financing them to develop the value chain(s) from which they source their produce (EUR 181 million). Key motives for working through lead firms are that this leverages private sector resources and that aligning public and private goals guarantees sustainable development.

One example of such an intervention supported by the Netherlands is the Sustainable Trade Initiative (IDH), which works on global value chains (EUR 34 million).[47] IDH forms public-private partnerships around a number of high-value commodities (e.g. cocoa, tea, coffee, cotton, flowers, aquaculture, etc.) with leading agrifood multinationals (e.g. Mars, Unilever, Cargill, IKEA) to introduce voluntary sector-wide sustainability standards, such as UTZ certified and Better Cotton. IDH lobbies at a pre-competitive level for sector-wide improvements in environmental impact, farmer income, and labour conditions (see pathway 11 on public and private sector dialogue), and also financially supports individual company proposals for value chain development, which can include farmer training and certification.

47 This is the amount IDH received in total in 2012 and 2013 from the food security budget. From 2014 onwards, the support to IDH by the Netherlands continued but came from the private sector development budget line.

Whereas IDH takes a global approach, the private sector window of the Global Agriculture and Food Security Program (**GAFSP**) implemented by IFC and supported by the Netherlands (EUR 98 million) focuses on domestic markets. Through the GAFSP fund IFC provides concessional loans to exporters, processors, cooperatives, and other lead organisations to establish or upscale high-value sourcing systems.[48] This often includes providing assistance to farmers to help them meet high-value standards.

A final example of an activity following this pathway and supported by Netherlands is **FDOV** (Facility for Sustainable Entrepreneurship and Food Security), managed by the Netherlands Enterprise Agency (RVO) (EUR 38 million). Like GAFSP this fund finances lead companies active in local markets, but it is quite different in implementation. An important difference is that FDOV stipulates implementation by a public-private partnership involving one public body, one company, and one NGO or knowledge institution. At least one of the organisations in the partnership must be registered in the Netherlands. Moreover, whereas GAFSP provides a loan, FDOV provides a subsidy that should be matched by a private contribution of at least 50% of the total project budget.

Projects following this impact pathway affect farmers in two ways. First, for some farmers projects may create access to high-value markets previously not available to them. The farmer may profit from this if, as a consequence, he or she is able to obtain a higher (or more stable) price. Secondly, these interventions typically include assistance to farmers, facilitated or coordinated by these lead firms, such that the farmers can comply with the standards of high value markets. Such assistance may include training, provision of farm inputs, and certification. This influences the production technology applied by these farmers and, in turn, is expected to influence the resource efficiency and the total production of food, both of which in combination with a higher price might lead to higher incomes for farmers.[49] The central assumption of the interventions following this pathway is that partnering with a lead firm has a positive impact on others in the value chain: employees, consumers, and in particular on the agricultural suppliers of these firms; on what they produce, how they produce it, and on their welfare.

Evidence

For both FDOV (KIT, 2016) and GAFSP (Platteau et al., 2016) a mid-term review is available (both evaluation quality category 4), but because both funds are still in an early implementation phase, it has not yet been possible to estimate their effectiveness. The effectiveness of IDH, however, was reviewed by IOB in 2014 (IOB, 2014a).

[48] Both GAFSP and FDOV also finance projects that follow the input and services value chain development pathway. See next paragraph.

[49] An alternative intervention logic, not illustrated here, is supporting a lead firm such that the availability of nutritious or environmentally friendly food is increased. Both FDOV and GAFSP have funded projects that follow this pathway. For example, GAFSP financed the Africa Improved Foods Limited (AIF) project for the construction of a processing plant to produce fortified blended food for babies and infants in Rwanda. That project is also intended to improve the income of 12,000 farmers who supply the facility with raw materials.

Based on the available IDH impact evaluations (on tea in Kenya and cocoa in Ghana) and broader literature, IOB concluded that the programme had had positive but modest effects on farmer yields, prices, and farm revenue.[50] However, no evidence could be presented that IDH programmes have improved farmer welfare and reduced poverty. These commodity value chains have the advantage of reaching many farmers, all of whom are organised and registered, and are slightly better off.[51] Although farm revenue increased as a result of the project, the costs of production have increased as well. IOB also concluded that the price premium[52] for certified produce in new standards are limited or temporary, and are only partly passed on to farmers as additional farmer income, or are used to cover the cost of certification. For some certified products there was no price premium for farmers at all. Moreover, the upward income potential of participating farmers is limited, primarily due to the relative small size of participants' land holdings. Regarding the environmental dimension, there are some indications of standards and certification having small positive effects, but the evidence base is still very narrow.

These findings are not sufficiently representative to allow far-reaching conclusions to be drawn on the effectiveness of all the interventions following this pathway. Looking at the broader literature, there are few studies available that could help us in estimating the effectiveness of these types of interventions. There is, however, an expanding literature on the effect of farmer participation in high-value chains (e.g. supplying export markets or domestic supermarkets which require higher standards) and on certification schemes that can inform us about the *potential* effects of lead-firm value chain development.

There is much evidence that farmers have improved their welfare by participating in high-value chains (almost always involving some type of contract farming) in products such as fruit and vegetables, tobacco, coffee, aquaculture, dairy, poultry, cocoa, potatoes, and rice. A meta-analysis of the welfare effects of contract farming based on 26 studies revealed that contract farming had increased welfare of participating farmers by 62% on average (Ton et al., 2016).

The literature on certification is less positive however. A recent systematic review by Oya et al. (2017) concludes that despite positive effects on prices (14% increase) and farm revenue from certified produce (11% increase), there is no evidence that, on average, certification schemes improve the total household income of participating farmers.[53] The review does

[50] See 'Final impact evaluation of Farmer Field School implementation in the smallholder tea sector in Kenya, 2009-2016' (Waarts et al., 2016) and 'Impact of UTZ certification on cocoa producers in Ghana, 2011 to 2014' (Waarts et al., 2015).

[51] For example, only a minority of the cocoa farmers in Ivory Coast are organised in producer groups, and these groups comprise relatively better-off farmers and qualify for group certification.

[52] Certified products are usually traded at a higher price (normal price plus a price premium) than conventional, uncertified products.

[53] Examples of certification schemes are those of GlobalGAP, Fairtrade, Organic, RSPO, Rainforest Alliance, UTZ, and RSPO. Fairtrade is the most dominant scheme in the review, as it has been evaluated by over half the studies included. The certification interventions reviewed affected participating farmers through a combination of standard-setting actions, capacity building and training, and different types of market interventions, such as guaranteed market outlets, a price premium, and credit facilities. These types of interventions are therefore very similar to projects supported by IDH and, to a lesser extent, by GAFSP and FDOV.

find schemes vary widely in design, context and, consequently, in effectiveness, which suggests that certification can improve farmer welfare but only for certain types of certification interventions in certain contexts. Moreover, there are indications that within schemes there is large variation in welfare effects on farmers. Some studies show that for the most resource-poor farmers the benefits do not outweigh the necessary investments and additional costs required for participation in contracts, certification schemes, and other institutional innovations that increase market access (e.g. Cavatassi et al., 2011; Hansen and Trifković, 2014; Verhofstadt and Maertens, 2014a).[54] Instead, 'medium-sized' farmers seem to benefit the most.

Our review of the evaluations and the broader literature led us to identify two risks associated with value chain development through lead-firm financing. First, public finance to projects implemented by the private sector might not be 'additional' to initiatives that would have been carried out by the private sector on its own.[55] This concern is shared by the available evaluation reports. The mid-term review of GAFSP, for example, finds that the additionality of the investments is not sufficiently safe-guarded and 'requires improvement'.[56] The review of IDH (IOB, 2014a) questions whether public funds should be used to support a single company's commercial investments in which development goals are 'embedded', especially if these investments can be considered 'core business'. The mid-term review of FDOV, however, is more positive and suggests that FDOV funding led to faster and larger-scale implementation of private sector initiatives, more collaboration among public and private actors, and more innovative business models. It also cautiously notes that there are indications that FDOV funding has led to more inclusive projects.

The second risk is that public goals (e.g. improving the income of resource-poor farmers) may not be aligned with the goals of the lead firm. After a profit-maximising company has entered into a contract with the farmer, it will use its bargaining power to claim most of the value generated by the project.[57] The question is whether, in general, it is in the farmer's best interest for ODA-financed projects to be wholly or partly designed and implemented by large lead firms. The firm probably wants to engage with suppliers who can deliver the produce at the lowest cost. It is likely to be more profitable to enter into agreements with a small number of large farmers than with a large group of small farmers. Small and resource-poor farmers might therefore be excluded. The conclusions presented in the empirical literature on this issue vary: some studies find that smaller farmers are more likely to be excluded, but others find that they remain included, particularly in labour-intensive sectors such as horticulture (Reardon et al., 2009). The FDOV mid-term review argues that most of the projects financed by

54 This is consistent with benefits that are positively related to the area of the land (such as in the case of a price premium) and costs and investments that are to some extent fixed per farmer or per transaction.

55 Additionality is the extent to which public support results in private sector activities (and associated results) being larger in scale, of higher quality, taking place quicker, taking place at a different location, or taking place at all (DCED, 2014).

56 Out of four in-depth project analyses one project was rated as 'not additional', two were rated as additional 'with limitations', and one was rated as 'additional'. Moreover, the review finds that finance proposals 'lack a deeper argument as to GAFSP's specific input and development additionality'.

57 But the share of the value that the company can claim depends on various factors, such as the farmer's ability to side-sell his or her produce (see Kuijpers and Swinnen (2016) for a discussion).

FDOV are oriented towards small-scale farmers (who are '(potentially) commercially viable') but tend to exclude resource-poor or subsistence-oriented farmers.

In reaction to these concerns, FDOV now demands an NGO to be involved to represent the interests of farmers and wage labourers and to ensure the inclusiveness of the initiative. It is, however, unclear whether NGOs are capable of fulfilling this role, especially if they become financially dependent on these partnerships and also fulfil a role as service provider within the scheme (e.g. providing farmer training) (Bouma and Berkhout, 2015).

To conclude, working through large lead firms has resulted in an outreach to many smallholder farmers, and has leveraged private sector resources for sustainable development. So far, however, there is little evidence on the effectiveness of this approach on farm production and income, and little understanding of the right conditions for impact. In view of this and the identified risk for weak additionality and misalignment of private and public objectives, further research and monitoring are recommended.

4.5.2 Inputs and services value chain development (pathway 3b)

Projects in this sub-pathway generally assist key intermediaries, service providers, or input distributors to improve farmer access to a specific service or input that is essential for increasing yields and profits. This type of value chain development is mainly motivated by the assumption that improving access to inputs and services by assisting the private sector is more cost-effective and more sustainable than setting up public farmer support in the form of input subsidies or public information services.

The Netherlands particularly supported value chain development interventions intended to improve smallholder access to high quality seed (in total EUR 23.4 million in expenditures during the review period).[58] A good example is provided by the **Integrated Seed Sector Development** (ISSD) projects implemented by Wageningen University and Research in Ethiopia, Burundi, and Uganda. These projects lobby for regulation that allows for private production and marketing of improved seed varieties, and addresses quality and organisational bottlenecks in the seed value chain by setting up and supporting local seed cooperatives, nurseries, and small seed companies. Similar seed value chain projects, implemented by other organisations are supported by the Netherlands in South Sudan, Mozambique, Ghana, and Kenya (see Table 4.3).

[58] High quality seed might be higher-yielding, more disease-resistant, or result in better quality agricultural produce.

Table 4.3 Seed sector development projects financed by the Netherlands	
Country	**Expenditure (2012-2016) (EUR million)**
Kenya	1.1
Ethiopia	6.8
Burundi	2.6
Uganda	6.3
South Sudan	1.9
Mozambique	4.4
Ethiopia (via FDOV)	2.5
Tanzania (via FDOV)	4.8

Another important example is the support of the Netherlands to **Geo-Data for Agriculture and Water (G4WA)** (EUR 19.6 million), a programme supporting public-private partnerships in ten countries in Asia and Africa. These partnerships are intended to set up commercial satellite-based information and insurance services for farmers and other organisations. Each partnership must include at least one Dutch organisation and requires private companies to contribute between 30-40% of the project budget.[59]

Evidence

The evaluations conclude that seed sector development is relevant for developing the agricultural sector in these countries. In Uganda and Ethiopia, farmers generally still mainly rely on informal seed systems for many crops and there is great uncertainty regarding seed quality (CDP, 2014; Ecorys-WUR-NMA, 2017). Moreover, the current centrally-planned seed system in Ethiopia, in which the Ethiopian government buys all certified seed, bulks it, and distributes it via multipurpose cooperatives, is considered to be inefficient. Within this system there is no direct contact between seed producers and seed users, which results in market inefficiency (inadequate coordination of supply and demand), a lack of accountability from seed producers to seed users, a lack of incentives to improve seed quality, and the inability to produce seeds that are adapted to local agro-climatic conditions.[60]

The ISSD project in Ethiopia used a two-pronged approach to tackle these issues. First, it successfully lobbied for a system in which seed can be marketed directly and freely. That the government has now allowed direct marketing of seeds in four regions can, according to the IOB evaluation report, 'to a large extent' be attributed to the ISSD project, which piloted and advocated this policy. In addition, ISSD is involved in developing further enabling policies for the seed sector and is valued by the Ministry of Agriculture and the Agricultural

[59] Note that FDOV and GAFSP also work via this pathway by financing projects that focus on creating a market for particular services, inputs, or technologies. FDOV, for example, is financing a number of projects that are setting up commercial businesses to provide farmers in developing countries with improved seeds (see Table 4.3.), equipment (e.g. tractors, hatcheries, and greenhouses), and finance.

[60] For a further discussion, see the IOB-commissioned country report on Ethiopia, Ecorys, 2017.

Transformation Agency as a 'focal point' for policy makers to discuss issues related to the seed value chain. Secondly, ISSD is building the capacity in the seed sector, mainly by establishing and supporting seed-multiplying cooperatives ('Local Seed Businesses' (LSBs)). The idea behind these businesses is that they contribute to greater availability and quality of improved seeds, and that by selling directly to seed users they offer an alternative to the centrally-planned system and avoid its inefficiencies. This component, which is the core of almost all the seed development projects supported by the Netherlands, was the focus of the rigorous impact evaluation commissioned by IOB (see Box 4.1. for detailed results).

Box 4.1 *Impact Evaluation of the Integrated Seed Sector Development Project phase 2 in Ethiopia*

Based on the IOB-commissioned country report: Ecorys-WUR-NMA, 2017. Evaluation of the Dutch Food Security Programme in Ethiopia – including an impact study of the Integrated Seed Sector Development Project (ISSD II).

Background: The ISSD project in Ethiopia, implemented by Wageningen University and Research, and Ethiopian universities, is one of the embassy-funded projects whose effectiveness IOB evaluated in depth. The government of Ethiopia controls the formal seed sector. It contracts out seed multiplication to large farms and distributes improved seed to farmers through multipurpose cooperatives, but without informing farmers about the origin or variety of the seed. Farmers mostly use traditional varieties, traded informally between farmers at local markets. One of the key components of the ISSD-II programme is the establishment of local seed businesses (LSBs): groups of farmers trained in the production of improved seed, using both local varieties and improved varieties developed by universities, applying the right harvesting, cleaning, selection, and storage practices, and selling some of this improved seed to government agencies, and some directly on the local market.

Result chain: The project expected the following effects: (1) establishing LSBs and training their members would enable the latter to earn an additional income from selling improved seed; (2) the availability of good quality improved seed would increase, accompanied by information about variety and origin; (3) this seed would be better adapted to the local environment, higher-yielding, and more preferred by farmers than seed distributed through the multipurpose cooperatives; (4) farmers who were not members of the LSB would use this improved seed and would increase their production – the main objective of the project. The evaluation extended this result chain to: (5) increased income and improved food security of farmers using improved seed.

Evaluation: The impact evaluation looked at the effects of newly established LSBs on the use of improved seed, production, income and food security in Tigray region by comparing LSB members with non-member farmers in the same villages and farmers in 'control' villages located at some distance from the 'LSB' villages. Some 1,000 households were interviewed in 2014 and in 2016. It was assumed that

farmers in control villages would not yet have access to the seed produced by the LSB at the time of the follow-up survey in 2016.

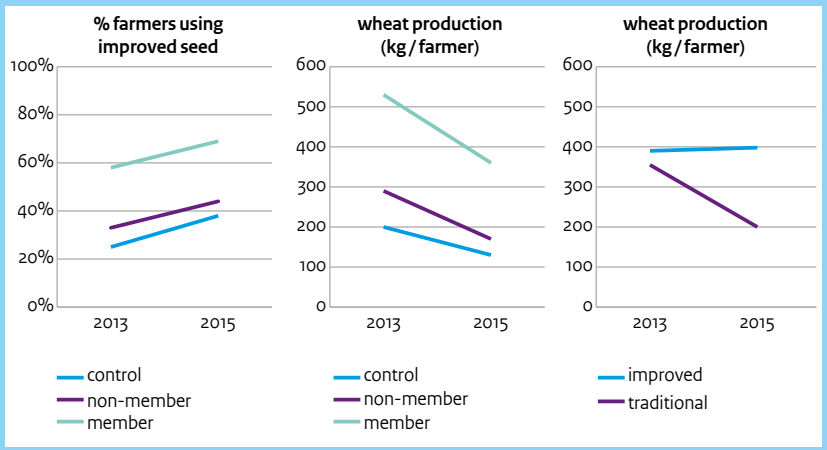
Context: In 2015, a drought caused by El Niño reduced crop yields throughout the region and the seed production by the LSBs, just before the endline survey in 2016.

Setting up LSBs: According to project documents, ISSD-II consolidated the 33 older LSBs, with over 3,500 member farmers from the previous project phase. In addition, 241 new LSBs were set up, with over 25,000 direct beneficiaries in 2015. The project estimated that about half a million farm households in Ethiopia benefited indirectly from using the LSB- produced seed.

Use of improved varieties: According to the evaluation, between 2013 and 2015 the adoption of improved varieties increased among all farmers in the region (LSB members, non-members in the same villages, and farmers in control villages: see left-hand graph in Figure 4.3). In 2015, LSB members used more of their 'own' LSB seed and bought less from the MPC, whereas non-members and farmers in control villages bought more seed from the MPC. Contrary to project assumptions, very few non-members and no control farmers bought directly from LSB. Instead, the government agencies bought most of the small amount of seed produced by the LSB and sold it through their MPC, without it being labelled as LSB seed.

According to the farmers, the improved varieties produced by the LSBs were no different than those provided by the MPC, nor were they of better quality. The main reason why some farmers still opted for traditional varieties was ingrained preference, not the unavailability or the higher price of improved varieties.

Figure 4.3 *Trends in the use of improved seed for the main crop (left), and wheat production per farmer (middle), comparing LSB members, non-members, and control farmers. On the right: wheat production per farmer, comparing improved with traditional varieties*



The seed produced by LSBs that entered the market through the government multipurpose cooperatives is likely to have contributed to the increased adoption of improved varieties in the region, but the evaluation could not determine the size of this contribution.

Crop production: Production in control villages, which was generally lower than in LSB villages, declined less than in LSB villages (Figure 4.3. middle). This could not be explained by the varieties used. The drought depressed the production of most crops, more for traditional varieties than for the short-duration improved varieties (Figure 4.3. right).

The impact evaluation does not provide evidence of any impact of LSBs on farm income or on the food security status of LSB members or households in the vicinity of LSBs.

Explanatory factors: a number of possible explanations are presented for the lack of identified impact on LSB members and non-members in the same villages.

- *Context.* The drought reduced seed production, and government agencies bought the LSB seed, thereby making it difficult for LSBs to sell seed directly to individual farmers.
- *Project design.* Some project assumptions turned out invalid: (1) the improved varieties multiplied by the LSBs were not better than those distributed by government agencies; (2) the LSBs had not (yet) resulted in an alternative direct market channel, but formed an alternative seed multiplication step in the government-controlled seed sector.
- *Project implementation.* Most LSBs were organisationally and technically not yet ready to produce and sell seed in 2016.

The impact evaluation finds that the LSB component of the ISSD II programme has not led to quality seed being used more in LSB areas than in other comparable areas in Tigray without LSBs. Instead, it finds the use of quality seed has increased throughout Tigray.[61] This can be explained by the fact that in LSB areas, direct sales from LSBs to seed users occur at an insignificant scale. Instead, the seed produced by LSBs is predominantly sold to the state-owned Ethiopian Seed Enterprise. This implies that the LSB component is not able to fully capture the envisioned benefits of the new direct seed marketing policy. The evaluation finds that it is, however, likely that through the centrally planned system, the LSBs have contributed to the increased availability and use of seeds in Tigray, but it could not estimate the size of this contribution.

[61] The percentage of farmers in the entire sample that used improved seeds for their main crop increased from 36% to 46%. Note that this sample is not representative for the entire Tigray Region.

A second key finding is that that the establishment and increased capacity of LSBs has not led to LSB members having higher incomes and improved food security. According to the evaluation, this is due to harvest failures in the 2015 season caused by drought and to the fact that LSBs have only recently been established and still lack capacity[62] and thus many have not yet managed to sell any seed.

In sum, seed sector development is a relevant and promising approach to sustainably improve farmer access to high quality seeds. The evaluation of ISSD in Ethiopia showed that the project has achieved tangible outcomes on an institutional level and has achieved outputs in the form of established LSBs. It is, however, uncertain whether these LSBs will be able to reach their full potential and whether they will prove to enhance direct contact between seed producers and seed buyers. Because the LSBs were not yet mature at the time of the evaluation, the evaluators could not assess to what extent the support to the seed sector had led to improved seed access, to what extent this access was inclusive, and whether improved seed access was sufficient for improving agricultural productivity.

Despite its relevance and promise, the development of value chains for inputs and services is the least integrated type of value chain development, as projects tend to focus on reducing only one constraint experienced by farmers, in order to improve their situation. This carries the risk of other constraints becoming binding instead: for example, the effects of improved seed use on agricultural yield depends on complementary agronomic practices, agro-climatic context, liquidity or credit constraints, access to complementary inputs, and marketing opportunities. This type of intervention can therefore be expected to be effective only in a conducive context where farmers predominantly face one constraint, or as part of an integrated or coordinated approach through which the other constraints are addressed simultaneously. The mid-term review of ISSD in Uganda states that opportunities exist to collaborate with other Dutch programmes (e.g. CATALIST, which focuses on various other constraints faced by farmers), but that synergy has so far been limited because programmes do not sufficiently overlap in terms of geography and crop focus.[63]

4.5.3 Integrated Value Chain Development (pathway 3c)

Integrated Value Chain Development combines all the approaches described above and some new ones, with the goal of upgrading the entire value chain and its stakeholders in terms of quality of produce, efficiency of the production process and/or sustainability. An explicit goal of most of the interventions is to improve the welfare or food security of small farmers. The approaches taken mostly involve training farmers, organising them, and coordinating transactions with input companies and buyers of produce (e.g. exporters, processors, retailers).

[62] This is also acknowledged by the project in their end narrative report.
[63] For a full discussion on policy coherence and synergy see Chapter 9.

The Netherlands supported 31 different activities (in total EUR 140 million expenditure during the period under review) that primarily follow this impact pathway. The largest programme supported is **2SCALE** (EUR 36.7 million), which is implemented by IFDC together with the International Centre for Development-oriented Research and BoP Innovation Centre. The second biggest programme in this pathway is **CATALIST** (EUR 29.6 million), which is also implemented by IFDC and has a similar approach to that of 2SCALE but with a different regional focus.[64],[65] Both programmes provide farmer training in integrated soil fertility management and facilitate partnerships between farmers and financial institutions, business support services, farm input companies, and companies looking for opportunities to source products from smallholders in Africa. In addition, 2SCALE also focuses on making nutritious food locally available by developing new products and marketing channels to reach poor consumers and young children.[66] Together 2SCALE and CATALIST aim at reaching 800,000 farmers in Africa.[67]

The third largest activity supported by the Netherlands within this pathway is **SAFAL**, implemented by Solidaridad in the horticulture, dairy, and aquaculture sector of southwest Bangladesh (EUR 13 million). It was more modest in scale than 2SCALE and CATALIST, as it intended to reach 50,000 smallholder families, but it had higher ambitions for each family and its programme was more intensive. Where CATALIST had ambitions to increase farm revenues, 2SCALE also has ambitions to make nutritious food locally available, and SAFAL had ambitions up to the level of improving the food security of participating households. To achieve this, the core activities of SAFAL can be grouped into five categories. First, the project trained farmers in adopting technologies that improve their productivity and that are necessary to comply with buyer standards. Second, it facilitated farmers to organise themselves in groups for collective exchange in input and output markets. Third, it represented these farmer groups in negotiation and coordination activities with input distributors and potential buyers such as traders, processors and retailers. Fourth, the project provided technical and financial support to 1,300 persons in project villages to become small-scale entrepreneurs in providing services to farmers in the community. This included input distribution (small shops), output collection, and transport. Finally, the project also included household training to improve nutritional awareness, knowledge, and practices.

Other programmes included **Sustainable Palm Oil** (EUR 11.5 million expenditure during the period under review) and CORIP (EUR 6.7 million) in Ghana, **PROOFS** (EUR 9 million) in Bangladesh, **BAGC** (EUR 5 million) in Mozambique, **EDGET** (EUR 8.2 million) in Ethiopia, **NAI horticulture** (EUR 3.4 million), and **KMDP** (EUR 5.2 million) in Kenya, and three projects in Indonesia: on **Vegetables** (EUR 4.4 million), **Aquaculture and Fisheries** (EUR 3.6 million), and **Poultry and Dairy** (EUR 3.9 million).

64 'CATALIST' includes CATALIST-2 in Burundi, Rwanda and Democratic Republic of Congo, as well as CATALIST in Uganda. Although these programmes had separate budgets, they followed the same approach.

65 Whereas 2SCALE works in Benin, Mali, Ghana, Mozambique, Ethiopia, Kenya, and South Sudan, CATALIST works in the Great Lakes Region (Rwanda, Burundi, Democratic Republic of Congo, and Uganda).

66 In 24 of the 52 2SCALE partnerships, BoP Innovation Centre was involved in setting up local value chains for nutritious food.

67 Both 2SCALE and CATALIST scaled down their ambitions during implementation from 1 million famers to 0.5 and 0.3 million respectively.

The core activity of these projects was coordinating and supporting other actors in the value chain, which primarily involved mapping the conditions under which private actors are willing to do business with smallholders, assisting those smallholders to meet these demands, and coordinating the transactions. This means that farmer training is often not just a stand-alone activity to increase production efficiency but instead might be necessary to meet private production and product standards of potential buyers (and certification agencies). In addition to coordinating, some projects have actively assisted key service and input providers with financial or technical support. Some programmes have also involved organising farmers, which might also be necessary to meet the demands of the private sector, as dealing with a group of farmers (represented by the project) rather than with each individual farmer might be less costly and less risky for the provision of information and services, for negotiations, and for sustainability.

Evidence

Two projects (SAFAL and CATALIST-2) were evaluated by IOB (Aidenvironment-APE-BRAC-IHE, 2017; AIID-PwC, 2017a). These evaluations were designed such that credible claims on effectiveness were possible. Although at first sight both SAFAL and CATALIST-2 had a similar project logic, the IOB evaluations of these projects revealed two very different stories. Whereas the evaluation of SAFAL (Box 4.2) suggests it is a success story that led to great improvements in agricultural production, household income, and food security, the evaluation of CATALIST-2 (Box 4.3) suggests that it had limited impact on cassava farmers in Rwanda.[68] While the evaluation found positive effects on some agricultural practices, it could not present evidence of positive effects on agricultural productivity and household income.

Box 4.2 *Impact Evaluation of SAFAL in Bangladesh*

Based on the IOB-commissioned country report: Aid environment-APE-BRAC-IHE, 2017. Evaluation of the Dutch food security programme in Bangladesh – including impact studies of SAFAL and Blue Gold projects.

Background: SAFAL was implemented by Solidaridad in the southwest of Bangladesh. It is one of the embassy-funded projects whose effectiveness was evaluated in-depth by IOB. It supported producer groups with the production and marketing of horticulture, aquaculture and dairy products, using an integrated value chain approach, including people with little or no land.

Result chain: the project expected the following effects: (1) organising and training groups of farmers would diversify production, improve farm practices and increase production value; (2) links with and involvement of buyers and processors would result in private sector investments in the value chain and improve conditions and prices for farmers compared to ad-hoc spot markets; (3) increased production and improved marketing would result in increased household income; (4) an inclusive

[68] The IOB evaluation only looked at cassava in Rwanda, while CATALIST-2 also worked on other crops, and in other countries: Democratic Republic of Congo and Burundi.

approach would create opportunities for people with little or no land, including in agro-services such as transporting milk. (5) A separate project activity created nutrition awareness which, together with higher income, would improve healthy food consumption.

Evaluation: Using a double-difference methodology, interviews were conducted in 2014 and 2016 in 400 households that had participated in SAFAL and 400 control households in similar areas not targeted by SAFAL.

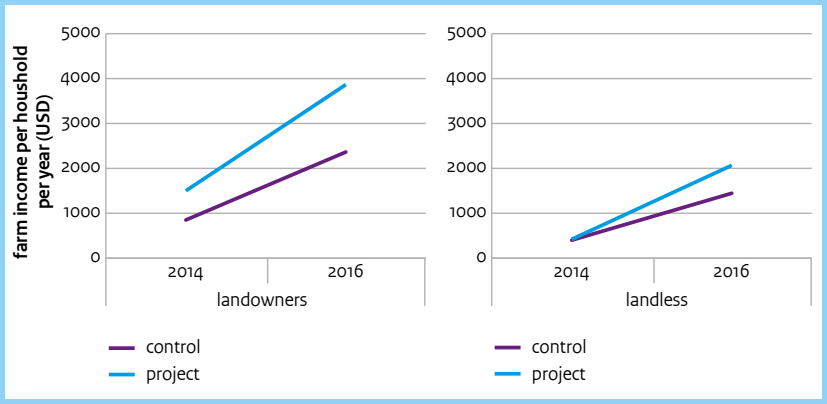
Context: In recent decades, agricultural production in Bangladesh, particularly of rice, has increased and hunger has declined. However, malnourishment is still high, due to poverty and low diet diversity. More recently, farmers have been diversifying into high value products, particularly horticulture and aquaculture. Improved road and water management infrastructure is facilitating this shift, particularly in the project area in southwest Bangladesh.

Agricultural production: According to project documents, SAFAL reached 58,000 smallholder farmers in 1,000 producer groups. According to the evaluation, participants had adopted improved practices and increased their production. The largest production and income effects were in aquaculture. Larger land owners also increased rice and horticulture production, while households owning little (<0.2 ha) or no land also increased milk production.

Creating market linkages: SAFAL successfully intervened at different points in the value chain. By establishing input and service centres, it reached 51% of the participants and reduced input costs by 10-20%. As a result of the setting up of collection and transport centres and the improved linkages with buyers, 40% of the households in the project were selling produce through SAFAL-supported value chains.

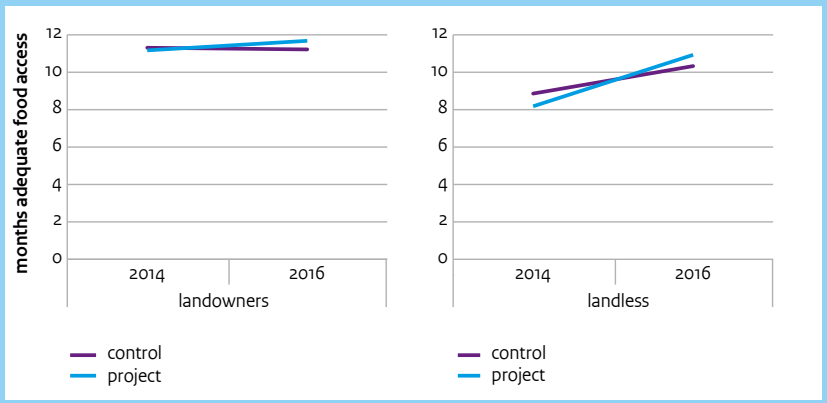
Household income: In general, farm income increased in the area. The project had an additional positive effect on total farm income, both for large land owners (an average increase of USD 840 per year) and for households with little or no land (an average increase of USD 594 per year). See Figure 4.4.

Figure 4.4 *Trends in farm income, comparing beneficiary and control households, for land owners and households with little or no land*



Food security: Food security had improved. For land owners, the project reduced the hunger period by 18 days and improved nutritional adequacy by 8%; but there was no effect on the household food insecurity access scale or on diet diversity. For households with little or no land, the project reduced the hunger period by 39 days and improved the household food insecurity access scale and diet diversity; but there was no effect on nutritional adequacy. (See Figure 4.5.)

Figure 4.5 *Trends in months of adequate household food access, last 12 months, comparing beneficiary and control households, for land owners and households with little or no land*



Explanatory factors: the factors accounting for success were:

- *Context.* The demand for high quality horticulture, dairy and aquaculture was growing fast in Bangladesh. Moreover, the road network in the region, which is especially important for aquaculture, had improved greatly in recent years.
- *Project design.* The project team had a clear theory of change, based on

Solidaridad's value chain development experiences in other countries and was well aware of the underlying assumptions. The project applied an integrated approach to tackle several constraints simultaneously at different points in the value chain.
- *Project implementation*. The project was intensive and project staff remained actively involved with producer groups throughout the project period. The project was flexible in tackling emerging problems and in seizing new opportunities.

Box 4.3 Impact Evaluation of CATALIST-2 in Rwanda

Based on the IOB-commissioned country report: AIID-PWC, 2017. Evaluation of the Dutch Food Security Programme in Rwanda – including an impact study of the Catalist-2 Cassava project.

Background: CATALIST-2 was implemented by IFDC in Congo, Rwanda and Burundi. It is one of the embassy-funded funded projects whose effectiveness was evaluated in-depth by IOB. The impact evaluation focused on one crop (cassava) in one country (Rwanda). Cassava is traditionally grown without any inputs, often on marginal soils, as a food crop with low yields. The potential cassava yield is high if the inputs are right, but this would require commercialisation of the crop. The main activities of the project included the provision of training on integrated soil fertility management (ISFM) and awareness-raising activities (demonstration plots, radio messages). This was complemented by improving access to fertiliser and improved cassava cuttings (which were initially given out for free as an incentive to participate in the training), financial and business training, and setting up linkages between groups of farmers and buyers, especially the Kinazi Cassava Plant.

Result chain: The project expected the following effects: (1) project training would lead to the adoption of integrated soil fertility management; (2) this, together with project-facilitated access to improved cassava cuttings, would lead to higher cassava productivity; (3) the project link to the cassava processing plant, training in business skills and project-facilitated access to credit would encourage farmers to invest in cassava production; (4) increased production and sales would lead to a 30% increase in cassava income, the final project objective. The evaluation extended this result chain to: (5) increased cassava income would result in increased total farm income, increased food consumption and reduced malnutrition.

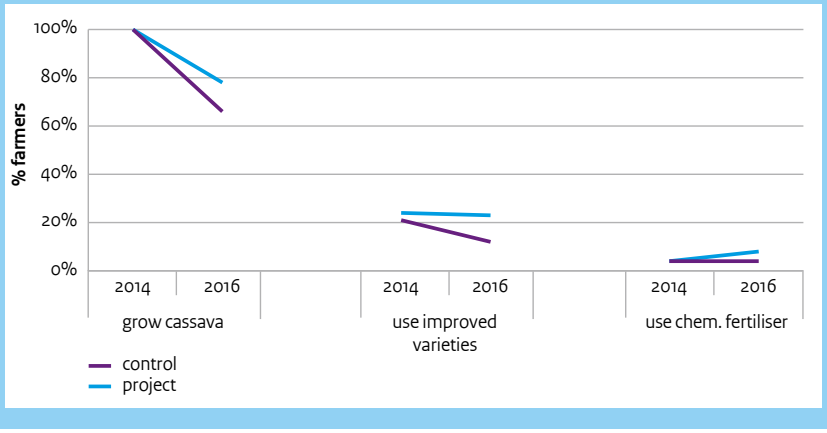
Evaluation: Using a double-difference methodology, interviews were conducted in 2014 and 2016 among 786 households, about half of which had participated in training activities in this 2-year period.

Context: The cassava brown streak disease (CBSD), which was already present at a small scale in 2014, had affected 74% of all cassava farmer: 54% indicated that in 2016 they had lost more than half their crop. On average, production in 2016 was one-third of that in 2014. The available 'improved' cassava variety, which was higher-yielding than traditional varieties, suffered just as badly from CBSD. FAO and the government imported and tested CBDS-tolerant cassava cuttings from Uganda, but apparently at a pace and scale that did not benefit the CATALIST farmers. The 'Kinazi' government cassava processing plant, established in 2012, which was expected to be the main market for cassava farmers, did not function well. Its operations were too expensive and prices paid to farmers were low.

Farmer training: Between 2014 and 2016, 12,894 cassava farmers were reached directly by CATALIST-2 activities. This is fewer than the anticipated 43,000. Many more farmers, about half of all interviewed cassava farmers, were trained in regular government training sessions that had adopted the ISFM recommendations. These farmers are considered to be indirect project beneficiaries.

Farmer adoption of practices: The project had a positive but modest effect on the percentage of farmers continuing with cassava despite the CBSD outbreak, on the use of improved cassava cuttings, and on the use of chemical fertiliser on cassava, but had no effect on the adoption of other ISFM practices (see Figure 4.6). Overall, the adoption of ISFM practices declined between 2014 and 2016 among both trained and untrained farmers. Many farmers that were trained before 2014 had given up the recommended ISFM practices by 2016. The analysis found no correlation between the adoption of ISFM practices between 2014 and 2016 and cassava productivity in that period.

Figure 4.6 *Farmer adoption of (1) growing cassava, (2) using improved varieties and (3) using chemical fertiliser on cassava: project farmers compared with control farmers*



The project did not result in increases in cassava productivity, the price received for cassava, household income, or food security.[69]

A few interesting project effects were found for smaller sub-groups. Women farmers that underwent both ISFM and business training received better cassava prices. Farmers that underwent the more intensive training given directly by the project-contracted NGO had increased total production value and received a more stable cassava price, but did not increase cassava production or income.

Explanatory factors: a number of possible explanations were presented for the lack of identified impact on agricultural production and household welfare.

- *Context.* The widespread CBSD disease discouraged farmers from investing in fertiliser and other inputs, and technical problems at the Kinazi Cassava Plant impeded the anticipated demand for cassava.
- *Project design.* The intensity of project support was low, with about 8 hours training per participant, while project ambitions were high: 43,000 direct and 57,000 indirect beneficiaries and a 30% increase in cassava revenue. In addition, cassava may not be suitable for the adoption of ISFM practices as it is often not grown as a cash crop, and the evaluation found no correlation between ISFM adoption and cassava yield.
- *Project implementation.* The project could have responded better to emerging problems: (a) to the CBSD outbreak, by distributing disease-tolerant cassava plant material; and (b) to the lack of demand from the Kinazi Cassava Plant, by linking farmers to alternative markets.

Two factors can be identified that might explain why the two projects worked out so differently. First, there was a large difference in context. The aquaculture sector in Bangladesh – and to a lesser extent the dairy and horticulture sectors – was booming during the project period. Between 2010 and 2015 the value of aquaculture production in Bangladesh almost doubled.[70] Moreover, aquaculture is a commercial pursuit for which investment pays off financially. Switching from rice production to commercial aquaculture has helped millions of families in Bangladesh to escape poverty in the past two decades (Rashid et al. 2015). The cassava sector in Rwanda, on the other hand, became depressed during the project period due to outbreaks of CSBD and cassava mosaic virus. The evaluation shows that between 2014 and 2016 about 39% of the cassava farmers in the sample stopped cultivating cassava due to the disease outbreak. Of the farmers that continued to cultivate cassava, 74% indicated that their harvest suffered from disease and 51% indicated that disease caused the harvest to be less than half of what was expected – which has implications, as cassava is an important food crop for home consumption for

[69] A few differences were found in nutrient intake and the number of meals per day eaten by children, but this could not be explained or supported by other project effects.

[70] The total value of aquaculture production in 2010 was USD 2.8 billion and had grown to about USD 5.2 billion in 2015. Statistics from FAO – Fisheries and Aquaculture Information and Statistics Branch (http://www.fao.org/figis/servlet/TabSelector#lastnodeclicked) on 13/06/2017.

many families. The fact that most farmers do not grow cassava as a cash crop explains the low motivation to buy fertiliser for it.[71]

Secondly, there are some key differences in project design and implementation. Compared to CATALIST-2, SAFAL was more flexible and had more resources available per farmer to do whatever was necessary to help their primary participants achieve a higher level. This allowed SAFAL to have a more integrated approach, addressing any constraint for improving household welfare that emerged during the project period. Moreover, whereas SAFAL remained continuously engaged with their primary participants for multiple years, CATALIST-2 offered a standard training module that typically lasted only one cropping season. The advantage of the SAFAL approach is that it builds a relationship of trust, not only between farmers and project but also between the project and other value chain actors.

At the time of writing this report, a draft qualitative process evaluation of 2SCALE was available that did not yet include the results of ongoing quantitative impact studies (Oomes et al., 2017). Therefore, in this report, little can be said about the effects on farm production or income. The 2SCALE project is interesting because it focuses on nutrition by increasing the availability of healthy food such as vegetables, milk and fortified baby food, by improving hygiene practices in production and processing, and by increasing the income of women and of female-headed households such as smallholder farmers and women in SMEs.

Compared to the other two value chain development sub-pathways, the integrated approach has three obvious conceptual advantages. First, as discussed earlier, inputs and services value chain development often focuses on one farmer constraint at a time (e.g. access to high quality seed), while agricultural production is often constrained by multiple factors (e.g. access to complementary inputs, natural resources, knowledge, and markets). By contrast, integrated value chain development tends to put the farmer – and the constraints he or she faces – at the centre of the design and implementation of the project, which makes it more likely that results will be achieved at an outcome level. Secondly, by putting the farmer rather than a lead firm at the centre, a project also puts the interests of society more at the centre. Thirdly, while a project that follows the integrated value chain development pathway also aims to align its activities with private sector interests and resources, it is more likely to avoid additionality concerns and more likely to be aligned with public goals.

One important concern of this approach is, however, the sustainability of the established linkages between farmers and the rest of the value chain. Once the public funding to the NGO ceases, the NGO will of necessity stop representing these farmers. Whether the linkages can be sustained will then depend on whether the farmers have sufficient capacity to keep themselves organised and to keep agreements with input providers and buyers in

[71] The reluctance of families to apply fertiliser to cassava is confirmed by the survey data, which found that only 3.2% of the farmers applied chemical fertiliser to cassava in 2013.

place. This makes it essential for initiatives of this type to have an exit strategy, to ensure long-term effectiveness.

The evaluation of the PROOFS project, for example, describes how the strong presence of the project is also a deterrent for large private firms to step in and take ownership of project activities (EDGE Consulting Ltd., 2016). Private ownership of the coordination activities between farmers and the private sector is key to ensure the sustainability of projects following this pathway. The PROOFS evaluation therefore suggests that the project must make agreements with the private sector that are more formal than Memoranda of Understanding, so as to clarify roles and increase ownership by the private sector.

To conclude, although integrated value chain development is one of the most promising ways to increase food production and farmer incomes, with many advantages compared to the other forms of value chain development discussed in 4.3.1 and 4.3.1, the evidence is still mixed. While SAFAL in Bangladesh had substantial effects on farm production, farm income, food security and dietary intake, CATALIST-2 in the cassava sector of Rwanda showed that the approach does not guarantee success. Key determinants of success are the project design and a conducive environment. Moreover, whether effects continue to be sustainable after project completion is a major concern.

4.6 Natural resource management for sustainable food production (pathway 4)

Some projects aim at assuring the stability and sustainability of food production in view of the scarcity of natural resources and the effects of climate change. For example, medium-term stability can be addressed by irrigation or fertilisation, while longer-term sustainability will also have to address water accounting and nutrient balances. A few projects have natural resource management as their main objective, but many other others have a minor environmental sustainability component added to their agricultural production objective.

During the period under review, total funding for the projects with natural resource management as their main objective was EUR 68 million. These relatively low expenditures are attributable to some of the natural resource management programmes being paid not from the food security budget (Budget Article 2.1), but from the budgets for improved water management (Budget Article 2.2) and sustainable use of natural resources and climate change mitigation and adaptation (Budget Article 2.3).

Although activities are different in many aspects – particularly regarding their geographical focus (global vs. local), time dimension (medium vs. long term) and level of integration (focusing on one issue vs. holistic approaches) – they do share a common intervention logic with three main tracks. The first track is to identify the priority sustainability issues at country level, which preferably feeds into a national food security policy but can also be

used directly for project-level natural resource management agreements and adjustments in agricultural activities. The second track addresses sustainability and climate resilience at farmer's field level, partly through influencing larger agricultural programmes such as IFAD's,[72] and partly by working on sustainable water management in agriculture. Both tracks should result in increased human capacity for resilience, eco-efficient land and water management for climate-smart agriculture, and climate-proof infrastructure (e.g. dikes and roads). A third and smaller track is the conservation of agrobiodiversity through supporting gene banks for future crop and livestock genetic improvement. All three tracks are expected to contribute to medium-term stability and long-term sustainability of food production.

One of the approaches supported by the Netherlands is integrated and participatory land use planning, such that resources are used optimally, fairly and sustainably. The biggest programme supported from the food security budget that follows this approach is the ongoing **Sustainable Development of the Gambella and Rift Valley Landscapes** project in Ethiopia (EUR 10.2 million during 2012-2016). Instead of taking a thematic area as a starting point, this project starts at the landscape and ecosystem level by building the capacity of multi-stakeholder platforms, steering committees and a conservation taskforce. The rationale for this project was that increased competition for land and water, from large-scale agricultural investors, small-scale crop farmers and livestock farmers results in conflict, unsustainable use of land, water and wildlife resources, and poverty. For example, over-exploitation of water resources for irrigation is causing the water level in Ziway Lake to fall. The project aims to mitigate these negative effects of resource competition by creating awareness and facilitating holistic and participatory land use planning involving government institutes, civil society organisations, and various land users.

Most of the projects following pathway 4 address stability and sustainability in combination with an overall agricultural production objective. The largest programme (EUR 40 million) within this pathway is IFAD's **Agricultural Smallholder Adaptation Programme** (**ASAP**). This grant programme adds 'climate-smart' components to loan-funded agricultural projects and is intended to reduce the vulnerability of smallholders to extreme weather circumstances caused by climate change. It primarily aims to do this by improving land management, water availability and efficiency, by training farmers to modify their production processes, by and investing in climate-proof rural infrastructure.

The **ESIRU** project in Rwanda worked on irrigation of marshland areas to improve resource efficiency (crop yields) and reduce land pressure elsewhere. Adjacent uplands were stabilised with terraces, infiltration galleries, agroforestry and grass strips, to reduce soil erosion and increase production. About 200,000 ha of marshland in Rwanda is suitable for cultivation. However, most of it does not have a water management / irrigation system, limiting production to an occasional dryland crop, while most is left idle.

[72] Influencing the sustainability and climate resilience of programmes and policies is also supported by the Dutch contribution to the international debate about climate-smart agriculture, which has a wider reach than the Dutch projects in partner countries.

Some projects addressing agriculture production stability are funded from budgets other than the food security budget. Examples are **Blue Gold** in Bangladesh (ongoing) and **Participatory Irrigation Sector Project** (**PISP**) in Indonesia (ended), which have a food security objective but are funded from the sustainable water management budget (see Box 4.4.). Both aim to improve the water management by rehabilitating water infrastructure and strengthening water management groups for the participatory operation and maintenance of this infrastructure. In Blue Gold, these activities are complemented by farmer field schools on productivity, marketing and nutrition. Another example is the organisation of the **second global conference on Agriculture, Food Security and Climate Change** in Hanoi in 2012, organised by Vietnam, the Netherlands, the World Bank and FAO. The first, organised in The Hague in 2010, resulted in the FAO-hosted Alliance for Climate-Smart Agriculture.

Other activities focus on global and long-term conservation and management of agrobiodiversity, such as the support to the **Global Crop Diversity Trust** (EUR 1.7 million) and the **Genetic Resource Policy** (EUR 1.1 million), which both aim to improve the conservation of and access to plant genetic material for future genetic crop improvement.

Evidence

Track 1: Land use planning and land management agreements
The IOB country evaluation team reviewed the Sustainable Development of the Gambella and Rift Valley Landscapes project and concluded that the project has contributed to protecting the natural landscape including the wildlife park in Gambella (Ecorys-WUR-NMA, 2017). Moreover, the project has played a key role in the start of restoring the ecosystem in the Central Rift Valley landscape. In both cases, the project has contributed significantly to government and community capacity development on improved landscape management and linked communities with environmentally friendly viable economic activities. Not much is yet known about the project's ultimate effects on environmental sustainability.

Track 2: Sustainable land and water management in agriculture
The ESIRU project has been successful in turning 1,000 ha swampland into 700 ha of irrigated land, conserving 300 ha marshland and stabilising 700 ha upland with terraces and other erosion control measures to project the swampy land (Seebörger, 2014). The project has been very successful in increasing crop yield and total production. Before the project, a few households would occasionally harvest one crop in the dry season in the marshland, which yielded at most EUR 120 per household per year, but most of the marshland remained unused or crops were lost before harvest. After the project, most land was under two crops of rice per year, yielding 2.5t/ha, producing on average EUR 300 in terms of crop value per household per year, from 0.1 ha irrigated land. Because it reclaimed previously unowned new land for cultivation, the project was allowed to distribute small, 0.1 ha irrigated fields to poor households. Although initially a few influential people managed to appropriate irrigated plots, most plots were distributed to very poor households.

ESIRU is one of the few evaluated projects with quantified information about the project costs and the production benefits per farm household, which allows us to draw conclusions about its cost-effectiveness, based on some assumptions and simplifications. The ESIRU project was intensive. It worked with few farmers (about 10,000) and expended about EUR 13,000 per ha, or EUR 2,100 per farm household, which is high compared to other food security projects. However, the benefits are also more substantial than those of many other projects. Comparing the additional crop value for farmers with the project investments per household, the project will break even in about 10-15 years. One concern, expressed by the Dutch embassy in Kigali, was that such intensive support cannot be replicated for a low cost on a large scale, yet the potential area for irrigation in Rwanda is huge (200,000 ha) compared to the modest area irrigated by this project (700 ha).

In terms of resource efficiency, the project has been successful: crop yields have increased. Intensive rice cultivation very likely reduces pressure on other, less productive land, and hence reduces land degradation. However, the environmental effects have not been measured.

The mid-term review of **ASAP** concludes that the fund is effective in streamlining climate in IFAD's project portfolio, but that it is too early to see any effects on adaptation to climate change (Grist et al., 2015).

Compared to ESIRU in Rwanda, the **Blue Gold and PISP** projects have worked more extensively, on a larger scale, and started with a baseline situation with more or less functioning irrigation and water management schemes.

A recurrent problem in irrigation projects, found specifically in Blue Gold and PISP but also more generally in our case study in Bangladesh and in the IOB evaluation on sustainable water management (IOB, 2018), is the low institutional sustainability of water management, due to weak government organisations and weak farmer water use organisations.

Box 4.4 *Impact evaluations of Blue Gold in Bangladesh and PISP in Indonesia*

IOB commissioned two impact studies of irrigation projects funded or co-funded from the Dutch 'water policy' budget, but with clear food security objectives: one study of the Blue Gold project in Bangladesh (Aidenvironment-APE-BRAC-IHE, 2017) and one combined study of the PISP and WISMP projects in Indonesia (IOB, 2018). These two studies were useful for this IOB food security policy review and for the IOB sustainable water management policy review.

Background: The **Blue Gold project** has invested in the rehabilitation of irrigation works in 23 polders in southwest Bangladesh covering 160,000 ha and hosting 150,000 households. The project has built on the results of previous water management projects in the polders, whose water management infrastructure required maintenance and fine-tuning. The project works with the Bangladesh Water Development Board for larger repairs, supports farmer water use

organisations for better water management and maintenance, and agriculture and marketing to increase farmer production and income.

Result chain: the project expects to achieve the following: (1) better water management, thanks to repairs to water infrastructure and the organisation of water management groups; (2) this, together with diversification and improved farm practices should result in higher production value; (3) the cultivation of more cash crops and increased farm income, in response to the setting up of value chains; and (4) this, together with nutritional knowledge and awareness activities, should improve food consumption and reduce malnutrition.

Evaluation: A difference in difference approach, with interviews of 400 households in two project polders and 400 households in two 'control' polders not targeted by the project, with a baseline in 2014 and an endline survey in 2016. Before the project started, the farmers in the control polders were better off, with higher production and income.

Context: The whole area has benefited from improved road infrastructure and from a diversification from rice to high value horticulture and aquaculture. The project rehabilitation of irrigation hardware was delayed, so the evaluation mainly captured the organisation of water use organisations and agricultural and marketing support, but these have been less effective due to constraints in water infrastructure.

Water management: Farmers were of the opinion that water management had improved. However, the supported farmer water management groups do not have a formal mandate to maintain water management infrastructure and in practice are little involved.

Agriculture and aquaculture production: Both in the project polders and in the 'control' polders, farmers have adopted new practices and new products, diversifying away from rice to, for example, mung bean, sesame, and fish. Fishery and aquaculture have particularly benefited farmers with little or no land. It is unclear to what extent some of these effects can be attributed to the project because of potential spillover to the control areas. Production and sales have increased in both project and control polders.

Sales and consumption: Contrary to expectations, the project has not increased sales. On the contrary, farmers in the project polders reduced their sales (statistically significantly) and seemed to have increased consumption of their own produce (but not statistically significantly).

Food security: Although there is no evidence that Blue Gold has increased farm income, participants have improved their food consumption: the hunger season has been reduced by 11 days, and diet diversity and nutrient adequacy have

improved. This may be due to project nutrient awareness activities. Malnutrition (child stunting) has declined in the whole area but not as a result of the project.

Sustainability: The maintenance of water infrastructure in Bangladesh is a concern because of the limited mandate and weak functioning of farmers' water use organisations in the operation and maintenance of the infrastructure, and the inadequate budget and poor functioning of the government Bangladesh Water Development Board for rehabilitation. The project has not addressed water accounting nor water efficiency, nor has it anticipated long-term sustainability issues such as the silting up of drainage channels, rising sea level and more irregular rainfall. No environmental effects have been reported.

Explanatory factors: a number of factors may explain the limited results:
- *Context.* Agricultural diversification and economic development were booming in the area, but may have had more effect in the better-off control polders. The government rules on organising water management groups have changed, which has contributed to the delay of project activities.
- *Project design.* The rehabilitation work required was underestimated. Much was expected from farmers' water management groups and from the Bangladesh Water Development Board. It turns out that water management groups have been unable to deal with the divergent interests of different water users, and have had limited capacity and mandate for operation and maintenance. The Bangladesh Water Development Board has seemed unable to plan and budget for the necessary rehabilitation work.
- *Project implementation.* The project could learn more lessons from other, similar projects, especially on how to organise water management groups, and could use other channels to influence the Bangladesh Water Development Board.

The Netherlands supported the **Participatory Irrigation Sector Project** (**PISP**) funded by the Asian Development Bank and the Water Resources and Irrigation Management Programme in Indonesia (WISMP) funded by the World Bank, both working on institutional development, water management plans, rehabilitation of irrigation infrastructure, and improved rice production. WISMP put more effort into institutional capacity building, while PISP put more effort into field-level rehabilitation work.

A comparison between project and control areas, after the project, without a baseline and correcting for other factors using propensity score matching yielded the following results for PISP:
- Water use associations functioned slightly better in the project areas and resulted in improving water availability in terms of volume and reliability.
- In project areas, farmers specialised more on rice, also thanks to vigorous government promotion.
- Cropping intensity was higher in project areas: more rice was grown in the first dry season, but only in irrigation schemes where water availability had been poor prior to the project.

- Averaged over all irrigation schemes, the project had no effect on yearly production. Therefore, there was no effect on farm income.

Given the inadequate nutrition of the populations targeted in Bangladesh and Indonesia, especially in terms of micronutrients, and given the correlation found between production diversity and diet diversity, it is questionable whether specialising in rice cultivation should be recommended for improving food consumption.

Like the ESIRU project in Rwanda, the **Char Development and Settlement Project** (CDSP) in Bangladesh, was intensive, (i.e. relatively expensive per beneficiary) and achieved a large effect when compared with the baseline situation in which poor households with very few assets had been allocated recently reclaimed land (Aidenvironment-APE-BRAC-IHE, 2017). The project improved water management infrastructure, which resulted in better drainage, less salinisation, increased cropping intensity (from 105% to 183%), improved rice yield and diversified farming (a change from rice only to rice plus vegetables, horticulture, fish, and poultry). Average household income increased by 126%.

Track 3: Conserving agrobiodiversity

The **Global Crop Diversity Trust** was supported for the maintenance and conservation of 13 crop collections housed in nine international gene banks. There are no direct effects of this funding, but the gene banks continue collecting new material, maintaining and conserving it, researching characteristics such as drought or disease tolerance, and supplying the material to plant breeders and researchers worldwide on demand, according to the PCR (GCDT, 2012). This contributes to climate change adaptation, long-term sustainability of crop production and agrobiodiversity.

In conclusion, compared to other food security activities, the water management and irrigation activities are relatively intensive (expensive), but also have more substantial benefits for farmers. Although good progress has been made in agricultural production and farmer income, it is unclear to what extent this results in medium- and long-term sustainability. Irrigation in itself makes the system less vulnerable to droughts than rain-fed agriculture, and irrigated land usually results in less degradation than rain-fed cultivation on slopes. Little is known about the long-term challenges and about the project effects on sustainability. This is partly related to the absence of a country analysis of the sustainability issues, complemented by baseline and monitoring data.

4.7 IFAD (multiple pathways)

The Netherlands funds IFAD with substantial voluntary contributions (EUR 98 million over the review period). IFAD supports a large portfolio of projects through concessional loans and grants. The projects, which are implemented by national governments, often combine several of the pathways discussed above; most projects contribute to increased farm

production and income. About 15% of the projects have been independently evaluated, with a thorough impact evaluation design. The 'Synthesis of lessons learned' from the IFAD-9 Impact Assessment Initiative (2016) has aggregated the results from about 38 impact evaluations. The aggregated results are summarised in Table 4.4, distinguishing the reach of the whole portfolio and the effect size found in impact studies. It confirms on the one hand the large number of beneficiaries (about 139 million between 2010 and 2015) and, on the other hand, the positive effects the projects have had on agricultural productivity, agricultural income, and total household income. In addition, farm households have increased their assets, reduced their exposure to shocks, and diversified their diet.

A simple cost-benefit comparison shows that in the period under review, the IFAD investment per beneficiary was USD 130 per beneficiary, spread out over six years, which resulted in an increase in income of USD 29 per beneficiary per year.

Table 4.4 Reach and effect size of IFAD programme 2010-2015

Reach in number of beneficiaries, in millions*		Effect size**	
Persons Households	139 14		
Active borrowers Voluntary savers	18 26		
Trained in: • Crop production • Livestock • Business	 4.4 1.6 1.4		
Increased agricultural revenue	44	Yields Agricultural income Income	+3.8% +18.0% +4.0%
Improved assets empowerment, resilience, diet	10	Asset index Reduced shock exposure Diet diversity	+6.6% -4.5% +4.6%

** Categories of beneficiaries are not mutually exclusive.*

*** This selection of impact evaluations has made an effort to quantify the effect attributable to the IFAD intervention. The modest effect found in the year of evaluation may continue in subsequent years, and it is hoped it will assist producers to move out of poverty eventually.*

4.8 Synthesis

The four pathways contributing to the policy objective 'improved sustainable production' have all clearly increased farmer production and income, be it to varying degrees, and for some pathways strongly depending on the project's design and implementation. None of the pathways has been shown to have had an incontrovertible impact on environmental sustainability, but this is because this aspect has not been systematically included in monitoring and evaluation.

The traditional way of stimulating agricultural development through research and extension has been proved to still be important. From the impact evaluations of some very successful research trajectories in the past it seems likely that agricultural research will pay off substantially in the future as a result of the contribution by the Netherlands to research in 2012 to 2016. A good link between research and extension is crucial, however, and part of the success claimed by research should also be credited to farmer extension and to developing the input value chains necessary for distributing the new innovations.

Even though some are only halfway through their implementation, the farmer extension projects and programmes supported by the Netherlands have shown positive, albeit modest, effects on technology adoption. Evaluations of the projects do not provide rigorous evidence of effects on food production and farmer incomes. From the documents reviewed, it can be concluded that small-scale, intensive farmer field schools have increased production and income, but the effectiveness of national extension schemes could not be confirmed. Farmer extension was more effective in improving farm income when combined with value chain interventions.

It is increasingly recognised that small farmers in developing countries are often constrained by many other factors besides a lack of knowledge and technology that can be addressed by research and extension. Extension has been more effective in increasing farm income when combined with value chain development and when research results and innovations are also brought to farmers by private sector actors in the value chain. In addition, working through public extension services may work well in some countries with capable services, as has occurred in Ethiopia and Rwanda, but may be less effective in countries with less capable or less motivated services. The role of the private sector is important in linking farmers to input and output markets, in linking producers to consumers, and in developing the agricultural processing sector in between. In view of this, it is understandable why the Netherlands has put much emphasis on value chain development.

The effectiveness of value chain development is, however, largely unknown, mainly due to the limited availability of good quality evaluations. There are very successful examples of integrated and lead-firm value chain development, but we have also seen examples of projects that have failed to deliver. Much depends on the project's design and implementation, and the conduciveness of the context in which it is executed.

In addition, there are some clear risks that can be identified and that depend on how the value chain development project is designed. Projects focusing on developing input value chains often focus on improving farmers' situation by lightening only one constraint they experience. This is insufficient to expect substantial improvements in agricultural productivity because other factors will continue to constrain the farmer. While lead-firm value chain initiatives are in that respect more integrated and tend to address a lack of access to farm inputs and to output markets, there are other risks relating to the effectiveness of this approach in meeting development objectives. First, public funds transferred to lead firms to develop the value chain might not be additional to what the

private sector would have contributed in the absence of the funds. Secondly, misalignment of private and public objectives might result in lower social and environmental benefits than expected. Thirdly, these value chains often work with a selected group of market-oriented, well-organised farmers who are often the 'better-off' farmers, leaving the majority of smallholder farmers unserved.

Compared to the other forms of value chain development, perhaps the most promising way to achieve the policy objectives is integrated value chain development, as its approach is designed and implemented with the actual needs of farmers in mind. Moreover, funds are not transferred to projects managed by large companies, which reduces the risk of misaligned public and private objectives and avoids (at least partially) the risk of limited additionality. It does, however, require an intensive and flexible approach to respond to the complex and changing realities that smallholders in developing countries are facing. It is more inclusive, also to poorer farmers, but the potential for scaling up and reaching large numbers of farmers has yet to be demonstrated. Moreover, the question remains whether the linkages established between farmers and private sector will remain after project completion.

Compared to traditional, government-led research and extension, and to some of the investments in the enabling business environment, such as roads and infrastructure (see Chapter 6), private sector led value chain development is less inclusive of smallholder farmers. However, it may create off-farm employment, which is much needed, given that the agricultural transformation may result in many current subsistence farmers and their children no longer being able to make a living from farming in the future. Yet employment creation is hardly ever an explicit objective of value chain development projects and therefore hardly ever monitored and evaluated.

In sum, value chain development is a promising complement to the more traditional instruments for agricultural development, such as government-led agricultural extension services and input subsidies, but the risks of the various approaches are often neither recognised nor addressed sufficiently, and much is still to be learned. Additional research and more rigorous evaluations are therefore recommended.

Finally, natural resource management looks at the natural resources environment in which farmers operate. This can be on a local, national, or global level and is necessary to assure the ecological sustainability of the global food system. However, little is known about the actual contribution of natural resources management to sustainability or climate resilience, partly because the projects considered were new, but mainly because this was not monitored and because measuring sustainability and resilience is difficult if not impossible in the short term. This lack of evidence should not be interpreted as indicating that it is not important to work on natural resource management for sustainable agricultural production. In fact, natural resource management should be an integrative part of all projects contributing to higher agricultural production and farmer incomes, but so far this is only happening to a limited extent – IDH being a positive example.

5

Contribution to increased access to nutritious food

5.1 Introduction

This chapter discusses the effectiveness of the pathways that contribute to the second policy objective 'increased access to nutritious food',[73] which aims to improve access to and consumption of nutritious food, and nutritional status. This objective addresses the immediate challenge of reducing hunger and malnutrition of vulnerable groups, including women and children. Three pathways contribute to this policy objective: (5) social safety nets, (6) nutrition awareness and behaviour, and (7) food fortification.

The chapter starts by describing the result chains of the three pathways that contribute to this policy objective, before giving an overview of the available evaluations. The subsequent sections (5.3-5.5) present the effectiveness of the projects that follow the three separate pathways; the final section (5.6) gives a brief synthesis.

The main finding is that by involving the private sector and normal market channels and through enforcement by government regulation, Dutch-supported projects have achieved impressive and cost-effective results with mass food fortification, although the effects will not be sufficient for specific vulnerable groups. The effects of nutrition awareness, behaviour promotion and social safety nets have also largely been positive. The mechanisms of distributing micronutrient powders for in-home fortification, appropriate for reaching specific vulnerable groups, are still in a development phase.

5.2 Pathways contributing to increased access to nutritious food

The three pathways each have a result chain towards access to and consumption of nutritious food and an improved nutritional status (see Figure 5.1). Note that for an improved nutritional status, not only food consumption but also water and sanitation, childcare, and health care play a role yet are not part of food security policy.

Social safety nets (pathway 5) provide food or cash to food-insecure households or individuals, and may in some cases also contribute to household assets, or communal public works constructed in food- or cash-for-work programmes. This is expected to increase access to and consumption of food, which may contribute to improved nutritional status.

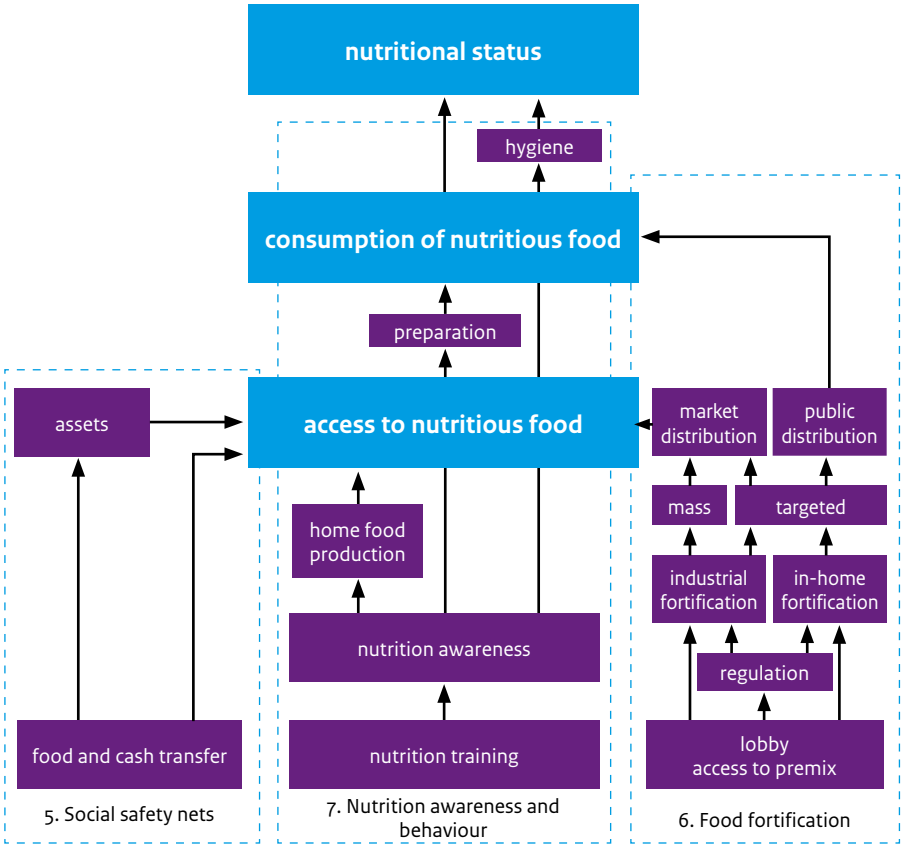
Food fortification, (pathway 6) addresses specific nutrient deficiencies, for example in vitamin A or iron, by using industrial fortification of common foods, or by distributing micronutrient powders that can be used for in-home fortification. Projects often import nutrient premixes and lobby for regulations that facilitate fortification and distribution efforts. There are two

[73] In this review, 'nutritious food' refers to food that contributes to a healthy diet in the context of poor, food-insecure households in developing countries. This often means food items rich in vitamins and minerals but currently eaten in insufficient quantities: vegetables, pulses, nuts and seeds, animal products. Some of what is considered 'nutritious food' in the context of developing countries can be unhealthy in the context of over-nourished people in developed countries.

distribution channels: (1) public health services that target specific vulnerable groups for improved nutrient consumption and (2) market channels that make the nutrients accessible to the wider population. The private sector can provide mass fortified food (e.g. enriched cooking oil) for all, or targeted fortified food (e.g. enriched milk powder) for infants. There are initiatives to use market channels also for micronutrient powders to be used at home.

Improving nutrition awareness and behaviour (pathway 7) mainly works through campaigns, training and advice, typically targeting the women in the household, who are responsible for food preparation. It addresses home production of nutritious food (e.g. vegetables), recommended practices of food preparation, and the hygiene, childcare, and feeding practices that are expected to contribute to better nutritional status.

Figure 5.1 *The pathways social safety nets, nutrition awareness and behaviour and food fortification, contributing to 'increased access to nutritious food'*



For this policy objective, we consulted ten evaluations, divided over the three pathways, representing in total 74% of the expenditure (see Table 5.1). We also drew on the ample evidence in the broader literature.

Table 5.1 Evaluation coverage (expenditure on evaluated projects / expenditure on all projects) and evaluation quality (policy objective 2)												
	Projects total		Projects evaluated			Eval quality*				Eval type**		
Pathway	No.	EUR mill.	No.	EUR mill.	cover	C1	C2	C3	C4	MTR	Eval	IOB
5. Social safety nets	13	84.3	5	61.2	73%	1	1	2	1	3	2	0
6. Food fortification	3	33.4	2	32.1	96%	0	1	1	0	0	2	0
7. Nutritional awareness and behaviour	7	55.1	3	34.9	63%	0	0	2	1	1	2	0
Total	**23**	**172.8**	**10**	**128.2**	**74%**	**1**	**2**	**5**	**2**	**4**	**6**	**0**

** Quality of evaluation: category 1 is best, see Chapter 2.*
*** Type of evaluation: MTR = mid-term review, Eval = evaluation, IOB = IOB impact study.*

5.3 Social safety nets (pathway 5)

Perhaps the most immediate way to assure food access and reduce hunger is to simply distribute food or cash to food-insecure individuals and households as part of a social safety net, school feeding programme, or emergency response.

Cash transfer programmes were funded in Mali as part of their emergency response programme, in Mozambique as part of the **Social Protection programme** (implemented by Instituto Nacional de Acção Social (INAS)) (EUR 5 million over the period 2012-2016)[74] and in Ethiopia as part of the **Productive Safety Net Programme** (PSNP) (see Box 5.1). PSNP took up more than half the expenditure for the activities within this pathway (EUR 46 million).

Direct distribution of food was funded by the Netherlands via a **WFP school feeding programme** in Burundi (EUR 18 million) and via a number of projects in Mali that transferred food to vulnerable households in response to drought and the ongoing security crisis (EUR 9 million).[75]

Dutch-funded social safety net projects use both cash and food transfers. Although cash transfers are often seen as purely a short-term solution for acute food insecurity, they often also have the objective of improving the long-term situation of poor households. For this reason, PSNP includes a cash-for-work component to build productive community assets (e.g. roads and irrigation systems) and is complemented by the Household Asset Building Programme, which provides households with highly subsidised credit to rebuild their individual asset holdings.

74 Unless otherwise indicated, all sums in parentheses refer to expenditure during the review period 2012-2016.
75 Essentially this is also the approach taken by many humanitarian aid programmes (including those funded by the Netherlands) and in particular by the UN World Food Programme. These activities have a separate budget line and are not discussed in this policy review. IOB evaluated Dutch humanitarian aid policy in 2015.

Two key assumptions underlying the logic of this impact pathway include:
1. Food-insecure households are well identified and targeted.
2. Productive safety nets have a lasting effect: supported households accumulate assets and move out of food insecurity.

Box 5.1 *Ethiopia's Productive Safety Net Programme*

For decades, the response to the persistent food security problems in Ethiopia had been annual appeals for food aid. The Productive Safety Net Programme (PSNP), launched in 2005, was intended as a shift away from a humanitarian relief system and towards a structural multi-year safety net programme. The major innovation of the programme is that it offers a structural solution for both chronic and transitional food insecurity.

In the period of evaluation, PSNP was in its third phase (2010-2015). The total budget for this phase was USD 2.2 billion. The Netherlands was one of the donors (albeit not a major one), alongside others such as World Bank, USAID, DFID, EU, and CIDA. The number of households benefiting from the PSNP varies and depends on the food security situation. According to information from the donor coordinating team, the maximum number of persons targeted during the third phase was 7.8 million people.

The PSNP consists of two main components:
- Public works, which focuses on building community assets using community labour, paid in cash or food. Of the total number of PSNP beneficiaries approximately 80% participate in public works schemes
- Direct support, which is a grant given to households who are unable to engage in labour-intensive activities (mostly the elderly and widows). About 20% of the PSNP participants receive direct support.

Evidence

The effectiveness of the PSNP in Ethiopia has been rigorously evaluated by IFPRI (Berhane et al., 2016; Hoddinott et al., 2015). For the highlands (Tigray, Amhara, Oromiya, and SNNPR) they found that on average, households that participated in the public works component reduced the number of days on which they were short of food ('the food gap'): from 95 days in 2006 to 53 days in 2014.[76] IFPRI estimated that 80% of this reduction (24 days) is a direct result of participation in the PSNP programme. They also estimated that every ETB 100 (approximately EUR 3.70) transferred to a household through the public works component has reduced the food gap by six days. Moreover, as a result of the programme, households have been able to improve the diversity of their diet by 21%.[77]

[76] On average, the transfer in 2014 was ETB 549 (approx. EUR 20.30) per household.
[77] In 2006, the average household in the sample consumed 3.3 different food groups (out of 10 food groups). By 2014, this figure had risen to 4.0.

The results of the PSNP are less pronounced in the lowland provinces (Somali and Afar). For the full sample in the lowland, there is no evidence of any positive effects on food security. The evaluation argues that this is mainly due to poor targeting. In both Afar and Somali, many rich households participated in the PSNP but a substantial proportion of the poorest households were excluded. When focusing the effectiveness analysis on the 50% poorest participants in the lowlands, the evaluation does find positive food security effects: for this group the programme led to the food gap being reduced to 16 days (from 37 days in 2012).

The PSNP did not result in households increasing their livestock numbers or their productive assets, except for the poorest households, who increased their livestock by the equivalent of one goat and three chickens.

These findings are generally consistent with the extensive scientific literature on cash and food transfers. There is broad consensus that well-targeted cash transfers, provided timely and predictably, lead to more stable access to food and improved food consumption (both in terms of quantity and quality) (Cockx and Francken, 2016; De Groot et al., 2015; Gentilini, 2015). The impact of cash transfers on the nutritional status of children is, however, less clear cut because it depends more on external factors (De Groot et al., 2015). The literature suggests that cash transfers are more likely to succeed in improving nutritional status if the transfer is larger, the targeted households are poorer, the children in participating households are younger, and food and complementary health care services are available (De Groot et al., 2015).

The evaluations of Dutch-funded projects did not look at the differences between food and cash transfers. There is little evidence in the literature to suggest that cash transfers are more effective than directly transferring food: there is no evidence that transferred food is systematically re-sold on markets or that cash is systematically spent on 'non-desirable' items (Gentilini, 2015). Although rigorous and comparable cost-effectiveness analyses of cash vs. food transfers is scarce, the available literature does suggest that food transfers are the costlier option (Gentilini, 2015; Margolies and Hoddinott, 2015). Hidrobo et al. (2014) estimate the cost effectiveness of three different modalities (food, cash, and voucher) in the case of Ecuador and find that food vouchers and cash transfers are up to five times more cost-effective than food transfers in improving the quality of the diet and up to two times as cost-effective in improving caloric intake.

The broader literature is less conclusive about the effect of cash transfers on long-term food security. However, with the exception of some studies (e.g. Baird et al., 2016), most find significant effects on household asset accumulation and future earnings (e.g. Blattman et al., 2014; Gertler et al., 2012). Research in Kenya suggests that one of the explanatory factors for long-term effectivity is the frequency of the transfer: although monthly transfers are more likely than lump-sum transfers to improve food security, lump-sum transfers are more likely to be spent on durable assets (Haushofer and Shapiro, 2016).

The Netherlands supports school feeding programmes, but these have not been evaluated. Many countries have school feeding programmes targeting children older than 5 years.

The main purpose of such programmes is to provide incentives for school enrolment, so evidence of nutrition benefits is scarce. A Cochrane review of 18 relevant studies of the effectiveness of school feeding programmes in improving the physical and psychosocial health of disadvantaged school pupils reported that the effects on pupils was an increase in school attendance by 4–6 days annually and weight gains (Kristjansson et al., 2006).

Summarising, the PSNP in Ethiopia has been effective in reducing the hunger period (food access and access stability) and in improving diet diversity (food utilisation), in the highlands of Ethiopia. In the lowlands, effects on food access stability have been limited due to poor targeting.

5.4 Food fortification (pathway 6)

About 2 billion people are deficient in key vitamins and minerals, the most important being vitamin A, iodine, iron and zinc, followed by vitamins B6 and B12. Pregnant and lactating women and young children are most vulnerable to these deficiencies because of their increased demands. Food fortification, which has long been used in developed countries, is considered safe, effective, and cost-effective. WHO distinguishes mass industrial fortification (e.g. adding iodine to salt) and targeted industrial fortification, (e.g. adding vitamins to milk powder for children of a certain age).[78] An alternative to industrial fortification is in-home fortification: micronutrient powders distributed through public or market channels to be added to food in the home.

Several Dutch-supported programmes aim to directly improve the nutritional status of micronutrient-deficient individuals by providing micronutrient powders for in-home fortification or by fortifying commonly consumed food with micronutrients.

Fortification initiatives may be purely commercial, public, or a mix of the two. Commercial initiatives use market incentives and private sector profit to drive the production and distribution of micronutrient supplements and fortified foods. Public initiatives often target the most vulnerable people (e.g. by distributing supplements for free, typically through health clinics). An example of a public-private initiative is the development of a national government regulation that makes it mandatory for private food producers to add certain micronutrients to their products.

The biggest Dutch-supported programme that primarily falls within this pathway is **GAIN**'s Driving Nutrition Impact project (EUR 32 million total expenditure 2012-2016). GAIN is an international NGO that sets national agendas, translates research and knowledge into policy, coordinates public and private stakeholder interests, and provides technical assistance to public and private nutrition initiatives. Depending on the characteristics and

[78] WHO considers a third approach: market-driven industrial fortification, in which fortified food is offered for a particular consumer niche, but this is less relevant in the Dutch food security programme.

needs of the target group they advocate a more public or private approach, typically by facilitating public-private partnerships.

One other project that is supported by the Netherlands that primarily falls within this pathway is the **Flour Fortification Initiative** (EUR 1 million): a public-private partnership with the Ministry of Foreign Affairs of the Netherlands, Akzo Nobel NV, Hellen Keller International, and other partners for scaling-up flour fortification initiatives in almost all African countries.

Fortification initiatives are also supported via programmes that generally tend to use other pathways, such as the integrated nutrition programmes of **UNICEF** (pathway 7), which implement a number of public micronutrient distribution initiatives to treat the most severe cases of malnutrition: the **ARF** (pathway 1), which finances the development of fortified porridge in Uganda; **GAFSP** (pathway 3), which finances the construction of a processing plant in Rwanda that produces fortified food for infants and babies; and **PROOFS** in Bangladesh, a programme that sets up local distribution systems for products and services demanded by the 'bottom of the pyramid'. As part of this programme, community health advisors are trained to become self-employed entrepreneurs selling health-related products that include micronutrient supplements.

Activities following this impact pathway intend to improve access to micronutrients by distributing them directly, or by making micronutrients available commercially in the form of powders, pills, or fortified food products. This should lead to a more nutritious diet and better nutritional status. A few assumptions underpin the intervention logic: (1) The additional nutrients address a relevant nutrient inadequacy; (2) the fortified food or supplement reaches the people who need it; (3) the private sector is motivated to produce and distribute fortified food and micronutrient powders by additional profit or by a government regulation creating a level playing field; and (4) consumers are aware of and willing to buy fortified food or nutrient powders for in-home fortification.

Evidence

Two evaluations of two consecutive GAIN programmes are available. The first evaluation of the GAIN programme under the 'Schokland agreements' focused on the GAIN global premix facility in Geneva, concluding that this had developed into a global facility serving hundreds of buyers and sellers of nutrients for food fortification worldwide (Van Gerwen and Van Ede, 2014). According to GAIN's 2012 annual report more than 451 million beneficiaries in 39 countries had been reached directly and an unspecified number indirectly through other development partners (mainly UNICEF and WFP).

The second evaluation of the GAIN programme 'Driving nutrition impact', including a quantitative impact analysis of one of GAIN's activities in Indonesia, reported a number of positive results (MDF, 2017). The biological effect of consuming micronutrients on people with micronutrient deficiency is uncontested, and the production of micronutrients (e.g. by the GAIN premix facility in Geneva) is well developed. The challenge for GAIN is to link the two by motivating governments and the private sector to increase the availability of

micronutrient supplements and to motivate nutrient-deficient consumers to use them, either by purchasing them on the open market or obtaining them through public health workers. Because of the underestimated complexity of the challenges, GAIN has had to revise its plan, resulting in more institutional outcomes and less impact on undernourished people – at least for the present.

Best results were achieved with mass industrial fortification that was embedded in law. The combined efforts of GAIN and others in Bangladesh resulted in the government regulation on the compulsory fortification of edible oil with vitamin A in 2013. GAIN followed this up by supporting the private oil refineries to their production processes. This success is partly due to the commitment of the Ministry of Industry and the relatively small sector (19 refineries reaching 75% of the population). Other mass industrial fortification efforts are ongoing and less advanced, but promising. The use of existing marketing channels, rather than setting up a parallel distribution system, means that almost all consumers eat fortified food (including those that may not need it), but also makes the programme cost-effective. Although mass industrial fortification has a large reach, the effect on specific vulnerable groups is often insufficient, because of the higher requirements for these groups, or because these groups consume too little of it (Brouwer, pers.com.).

The distribution of micronutrient powders (MNP) for in-home fortification, which required targeted interventions and distribution of a new product through new public or market channels, was more cumbersome than the distribution of mass fortified products through existing market channels. In Mozambique, the results in reaching children with MNP through a voucher system were poorly monitored and way behind targets, and the government classification of MNP as drugs hindered the distribution by the private sector. The MNP distribution activity should be considered as still in its pilot phase. Results in improving the nutrition of industry workers (e.g. garment workers in Bangladesh) have been disappointing, due to low motivation of and low pressure on the industry.

In some cases, a nutrition context analysis was missing, which resulted in misguided interventions. For example, iron was promoted in Bangladesh and Mozambique, while groundwater in Bangladesh already contains enough bioavailable iron, and although it was known that in both countries anaemia was not caused by iron deficiency (but instead by malaria in the case of Mozambique).

GAIN's reach in terms of number of undernourished people consuming better nutrition is largely unknown, but is thought to be well below original targets, due to the complexity of the challenges and subsequent adjustments of the programme. GAIN impact studies have not yet shown any biological impact of its interventions.

A simulation study on industrial fortification in Bangladesh complements the results of the GAIN evaluation and shows that the fortification of oil with vitamin A is reaching 76% of the population, reducing the prevalence of inadequate vitamin A intake from 83% to 64%, which brings a saving of over 400,000 disability-adjusted life years (DALYs) at a cost of about USD 3.25 per DALY. Similar calculations made for iron, zinc, and vitamin A fortified wheat

flour showed smaller effects than fortified oil, due to the smaller quantities of flour consumed, but confirmed that these mass fortification efforts are also among the most cost-effective ways of reducing malnutrition (Fiedler et al., 2015).

These results are supported by the broader literature. A systematic review on micronutrient fortification found clear evidence of the nutrition and health effects of the consumption of fortified food (Das et al., 2013). Vitamin A, iron, and multiple micronutrients increased the haemoglobin levels of children, iron boosted the haemoglobin levels of women of reproductive age, and calcium and vitamin D had positive effects on post-menopausal women. Zinc increased the serum zinc concentration of children and reduced stunting of children with very low birth weight. Folate reduced congenital abnormalities and iodine reduced the incidence of hypothyroidism. However, the use of multiple micronutrients did not significantly reduce child malnutrition (stunting, wasting, underweight), although trends were positive. Obviously, for reducing child malnutrition, other conditions such as water, sanitation, and health care also play a role. The review warns that possible malabsorption caused by diarrhoea and parasites will undermine the fortification efforts.

A systematic review on food supplementation for disadvantaged children aged from 3 months to 5 years included a meta-analysis of randomised control trials, which found significant effects on child growth (i.e. weight and height for age) and moderate positive effects on haemoglobin levels and psychomotor development (Kristjansson et al., 2015). The review cautioned for leakage, especially when supplements are to be given at home; only 36% of the supplements to be consumed at home were actually consumed by children, whereas 85% of supplements given at day care or feeding centres were consumed by children.

In conclusion, the evaluation of GAIN showed that the mass food fortification strategy of enriching edible oil with vitamin A, supported by government law, effectively reached a large part of the population in Bangladesh. A simulation study and two systematic reviews confirm the effectiveness of food fortification in increasing the availability, access and use of micronutrients, which results in raising the haemoglobin levels in children and women of reproductive age (vitamin A, iron) and reducing stunting among children (zinc). Mass food fortification is considered to be cost-effective, but may not be sufficient to reach specific vulnerable groups.

In-home food fortification with micronutrient powders, which can target specific vulnerable groups, is more cumbersome and costly than mass food fortification because a parallel distribution system needs to be set up. The effectiveness of these initiatives is unclear, however, as they are still in a test phase.

5.5 Nutritional awareness and behaviour (pathway 7)

One way the Netherlands has contributed to eradicate hunger and malnutrition in the short term is by making people aware of the importance of good nutrition and by providing assistance to help them change their behaviour. The immediate objective of interventions using this pathway is to improve the nutritional adequacy of diets and to improve care practices (e.g. regarding breastfeeding and food preparation).

Most (in total EUR 49 million) of the contributions allocated to this pathway went to UNICEF integrated nutrition programmes in Burundi, Mozambique, Ethiopia, and Rwanda. Although the programmes are tailored towards the national context, they share a clear common approach: all aim to create awareness among policymakers about the importance of nutrition and to build the capacity of national systems to manage community-based health and nutrition services. This is mainly done by providing technical support (e.g. training community health extension workers) and equipment. The primary goal is to strengthen the delivery of evidence-based preventive services, such as growth monitoring and promotion, advice on feeding infants and young children, and prevention and treatment of severe acute malnutrition (e.g. by supplementing children's diets with micronutrients). Several projects support women-managed vegetable gardens for diet diversification. The UNICEF programme is strongly linked with SUN (EUR 1.3 million), which brings together public and private actors from different sectors to support national policies for upscaling initiatives to reduce malnutrition.

One other stand-alone project supported by the Netherlands followed this pathway as a primary strategy to improve food security: the FARN Nutrition project by *Groupe de Volontariat Civil* in Burundi (EUR 2.8 million). This project organised awareness-raising sessions and set up community structures around women whose children had a healthy weight and height, who could pass on nutritional knowledge. The training covered topics such as cooking, food diversity, breastfeeding, family planning, home gardening, disease treatment, and hygiene.

A few integrated value chain development projects (see Chapter 4) have included a nutritional awareness and knowledge component: 2SCALE (working on a number of local value chains of nutritious products in Africa), SAFAL and PROOFS in Bangladesh, and two value chain development projects in Indonesia (one on poultry and dairy, and the other on aquaculture). In two other cases (both in Indonesia) a separate nutrition programme was added to ongoing value chain development projects: the Good Nutritional Practices (GNP) programme (EUR 1.2 million) that was complementary to the Sustainable Cocoa Production Programme and the Improving Food and Nutrition of Tea Farmers project that complemented the Lestari Sustainable Tea Programme (EUR 1 million).

Two of the key assumptions that underlie the intervention logic for nutrition awareness and behaviour are: (1) the promoted behaviour is practically and economically feasible (e.g. food availability and access is not a binding constraint); and (2) the awareness and knowledge that is shared motivates project participants to change their behaviour (i.e. the

promoted behaviour is perceived to be beneficial, and socially and culturally acceptable within the household, or within the community).

Evidence

We had access to the UNICEF internal mid-term progress review (UNICEF, 2016), an internal evaluation of the GNP programme (Swisscontact, 2016), a project completion report on the Improving Food and Nutrition of Tea Farmers project (The Business Watch Indonesia, 2016), and an evaluation on the FARN Nutrition project (Deboutte, 2016). In addition, IOB conducted a short field study on nutrition awareness and perceptions of health, in order to understand the co-existence of child stunting and overweight mothers in southwest Uganda (Van Meijl, 2017). The four projects combined reported that they had reached 15 million persons and 40,000 households. This number excludes persons reached indirectly, for example through word of mouth or mass-media messages. The projects claim that most of the people reached were food-insecure.

Of the four reports available, only the evaluation of the FARN Nutrition project was conducted by an independent party and is of sufficient quality to provide useful information on project effectiveness. The evaluation concludes that the project has led to improved nutritional knowledge among parents and to a higher weight of children. It argues, however, that it has not reduced the prevalence of stunting among these children, for which factors other than nutritional awareness and behaviour may have been a constraint.

The broader literature teaches us that knowledge and awareness of nutritional issues is an important factor influencing actual nutritional intake (Spronk et al., 2014). However, it vies with a number of other factors that also influence behaviour, such as product marketing, social and cultural norms, intra-household dynamics, and habit.

A qualitative field study by IOB in southwest Uganda looked into the perception of healthy food, child nutritional status, and women's body size, and the perception of the relation between these three factors (Van Meijl, 2017). The study confirmed the co-existence of stunting and overweight, and even found children that were simultaneously stunted and overweight. The main study findings are:

- Mothers had good knowledge about healthy food and the importance of diet diversity, and were aware of the risk of eating insufficient nutritious food.
- However, because height is not monitored in post-natal consultations mothers were often unaware about children being stunted and the risk of stunting.
- Mothers saw obesity as a health problem, but had an incorrect perception about healthy body size: big is considered to be healthy and beautiful and to indicate wealth. Only extreme obesity is considered problematic. Although most of the women were clinically overweight, most of them thought this was either the right size, or even below the right size, partly due to cultural norms that value large body size as being wealthy and prestigious.

These findings validate the importance of the second assumption; i.e. that the promoted behaviour is socially and culturally acceptable.

Table 5.2 The selected high-quality evaluations on nutritional awareness and knowledge interventions

Type	Type of Intervention	Evaluation (Quality)	Output	Outcome	Impact
Osei et al. (2017) (Nepal)	Nutrition education and homestead production	Primary study (Cat. 1 (RCT))	NA	NA	**Child Weight/ Height:** (N.S.) **Mother Underweight:** -39%↓ **Anaemia child:** -38%↓ **Anaemia Mother:** -24%↓
Olney et al. (2015) (Burkina Faso)	Nutrition education and homestead production	Primary study (Cat. 1 (RCT))	**Knowledge on CNP:** ↑	**HH Dietary Diversity:** 0.8 Food group ↑ **Child Dietary Diversity (% minimum diversity):** 12.6% ↑	**Stunting:** (N.S.) **Wasting:** -8.8 p.p. ↓
Schreinemachers et al. (2017) (Bangladesh)	Nutrition education and homestead production	Primary study (Cat. 1 (dif-in-dif))	NA	**Vegetable consumption:** +19.33 grams per person	NA
Kang et al. (2017) (Ethiopia)	Community-based participatory nutrition promotion (child feeding)	Primary study (Cat.1 (RCT))	NA	NA	**Stunting:** -8.1 p.p. ↓ **Wasting:** - (N.S.) **Underweight:** -6.3 p.p. ↓
Kramer (2017) (Bangladesh)	Education	Primary study (Cat.1 (dif-in-dif))	**Nutritional knowledge:**↑		
Lassi et al. (2013)	Education/ counselling on child feeding practices	Systematic Review	**Knowledge on CNP:** ↑	NA	**HAZ:** +0.23 SD↑ **WAZ:** +0.16SD↑ **Stunting:** -29%↓
Imdad et al. (2011)	Education/ counselling on child feeding practices	Systematic Review	NA	NA	**Height:** +0.49 cm ↑ **Weight:** +0.3 kg↑

Legend: ↓ = decrease; ↑ = increase; CNP = Community nutrition programmes; NA = not available; NS = not statistically significant.

A few high-quality evaluations available in the broader literature have assessed the effectiveness of interventions intended to change nutritional behaviour (see Table 5.2). These cover two categories of interventions: (1) nutritional counselling specifically focused on young child feeding practices such as breastfeeding, complementary feeding, and complementary nutritional practices (two systematic reviews complemented by one recent

high-quality primary study); and (2) more general nutritional education complemented by homestead gardening promotion (three studies in total).

The findings reported in this selection of studies confirm the effectiveness of improving nutritional awareness and knowledge on dietary intake and nutritional status. Interventions focusing on young child feeding practices had reduced child stunting. General nutritional education and homestead gardening interventions had positively affected food consumption, but had not reduced the prevalence of child stunting. Dutch-funded interventions often included a component assisting women with vegetable home gardens to improve diet diversity and nutrition. The available evaluations of Dutch-funded interventions had not assessed this effect, but the literature confirms the value of home-grown nutritious food. A systematic review of the effect of 23 agricultural interventions (16 of which were vegetable gardens) on nutrition found that in most cases the promoted food product was indeed eaten more, but cautions for a possible substitution effect that was not monitored (Masset et al., 2011). Only a few studies found effects on iron and vitamin A deficiency, and on child nutritional status, but small sample sizes were generally a problem. The projects showing significant impact on micronutrient deficiency and child malnutrition were: (i) bio-fortification with yellow-fleshed sweet potato; (ii) home gardens (three cases); and (iii) intensive dairy among rural smallholders. The effect of orange-fleshed sweet potato on vitamin A adequacy was confirmed in five studies in a systematic review of training, innovation and new technologies (Stewart et al., 2016).

From these studies we identified two possible explanatory factors for the effectiveness of this approach, which confirm the importance of assumptions (1) and (2) that underlie the intervention logic presented above. First, targeting food-insecure households seems key. Effects on households that are food insecure seem to be greater than for households that are not (Imdad et al., 2011). Second, and perhaps counterintuitive to the first point, effectiveness can be expected to be less if the household experiences resource constraints, such as inadequate food access or a lack of time, because this can prevent households from putting advice into practice (Imdad et al., 2011; White and Masset, 2007). Recent research in Ethiopia shows that better nutritional knowledge can lead to large improvements in children's dietary diversity but only in areas with relatively good access to food markets (Hirvonen et al., 2017). Moreover, if access to such markets is problematic, home-gardening initiatives, mainly targeting women, can be an important way to improve the diversity of diets by increasing the diversity of the food available to the household (Hirvonen and Hoddinott, 2017).

Further research is needed to investigate what types of interventions are most cost-effective in what context. The current interventions supported by the Netherlands all involve physical household visits by health advisors. This approach is relatively costly and the outreach is limited. The Netherlands could look into additional, cheaper, innovative approaches with a larger outreach. However, there is a risk that in this case the intensity of the 'treatment' will be insufficient to elicit a behavioural change.

In conclusion, evaluations of Dutch-funded activities are too limited to draw sound conclusions on effectiveness. However, the broader literature confirms the effectiveness of nutritional awareness and knowledge interventions on nutritional knowledge and healthy food consumption. Activities focusing on young child feeding practices have reduced child stunting, while general nutrition awareness activities have improved food consumption, but do not seem to have reduced child stunting, for which other constraints need to be addressed as well. The IOB study in Uganda showed that besides nutrition awareness, other factors were important: people may know the importance of diet diversity but may have misperceptions about child stunting or adult over-nutrition and be unaware of the problem.

5.6 Synthesis

The three pathways contributing to the policy objective 'increased access to nutritious food' have all clearly increased access to and consumption of nutritious food, and have often also improved nutritional status. Their two main strengths are a cost-effective coverage of the entire population in the case of mass industrial food fortification, and in the case of the other two pathways – but in contrast with the first strength – specifically targeting vulnerable groups and offering them an immediate solution for their specific situation.

Based on the well-documented impact of the PSNP in Ethiopia and rigorous evidence from similar non-Dutch interventions, we conclude that social safety net programmes supported by the Netherlands have resulted in shortening the hunger period and improving the diet diversity of vulnerable households. Targeting and reaching food-insecure households is crucial. There are examples where poor targeting has had no effects on food consumption. There is only limited evidence of long-term effects through household asset accumulation.

Food fortification, especially industrial, mass food fortification backed by government regulation, as supported by GAIN, has shown impressive results in reaching a large portion of the population at low costs, and in improving the consumption of specific nutrients. However, mass food fortification may not be sufficient for specific vulnerable groups. In-home fortification with micronutrient powders that used market distribution channels was hindered by inappropriate government regulations. A parallel public distribution system has the advantage of being able to target specific vulnerable groups, but also turned out cumbersome and costly. Whether these initiatives are cost-effective is unclear yet as they are still in their test phase.

Based on one evaluation of a Dutch-funded project and a number of rigorous studies on similar projects, we conclude that nutritional awareness and behaviour projects supported by the Netherlands are likely to have effectively contributed to more nutritious diets. Effects on child stunting of general nutrition education activities are unlikely, due to other constraints such as inadequate childcare, water, sanitation and health practices, inadequate food access, and low access to healthcare services. Interventions that focused specifically on young child feeding practices (such as implemented by UNICEF) are, however, more likely to

succeed in reducing stunting. Home gardening, as promoted by the Netherlands in many of its interventions, is an effective way to increase the consumption of certain nutrients.

IOB research in Uganda revealed that knowledge about healthy food might not always be the main constraint in changing behaviour. People were often unaware of child stunting or had misconceptions about adult overweight. Other factors also affected household choices of food consumed, such as the availability of nutritious food, and social and cultural habits.

The pathways are partly related: the market distribution of micronutrient powders, which has not been successful so far, requires more effort to change nutrition awareness and behaviour, creating awareness of health, under-nutrition and home fortification, and creating a consumer demand for these food supplements. In addition, the different pathways may succeed each other, starting with social safety nets and targeted food fortification in very food-insecure areas and eventually progressing to a more structural solution in nutrient awareness, locally grown nutritious food, and mass industrial fortified food, as we know it in developed countries.

6

Contribution to the enabling business environment

6.1 Introduction

This chapter discusses the third policy objective: 'an improved enabling business environment'. Projects that contribute to this objective aim to improve the conditions in which farmers, enterprises, and other organisations operate. The central idea is that this will contribute to agricultural development (objective 1) and to increased access to nutritious food (objective 2). Projects that contribute to this policy objective can be grouped under four impact pathways: (8) land tenure security; (9) infrastructure (in particular, rural roads); (10) capacity building of farmer organisations; and (11) public and private policy dialogue.

The chapter starts by describing the result chains of the four pathways contributing to this policy objective and then gives an overview of the available evaluations. The subsequent sections (6.3-6.6) present the effectiveness of the three separate pathways; the final section (6.7) presents a brief synthesis.

The main finding of this chapter is that projects working on the enabling business environment have facilitated agricultural development to different degrees. One evaluation, backed by broader literature, shows that investments in rural roads have had the most convincing and uncontested impact on agricultural production, poverty reduction, and food access. Improving land tenure security in Rwanda has reduced land disputes, facilitated land rental markets, and has been inclusive for smallholder farmers and women. The literature shows that production and income effects are more positive in Asia and Latin America than in Africa, most likely due to the functioning pre-existing informal land tenure systems in Africa. Strengthening farmer organisations has had positive effects for the more commercially oriented organisations of slightly better-off farmers. Finally, multi-stakeholder policy dialogue has contributed to better policies and donor investment in the agricultural sector, and to private sector codes of practice and standards.

6.2 Pathways contributing to an enabling business environment

The four pathways each have their own results chain, but these are very diverse and do not all contribute to the same 'enabling business environment' indicators. However, extending the result chain beyond the enabling business environment reveals their contribution to higher food production and farm incomes (policy objective 1) and increased access to nutritious foods (policy objective 2) (see Figure 6.1).

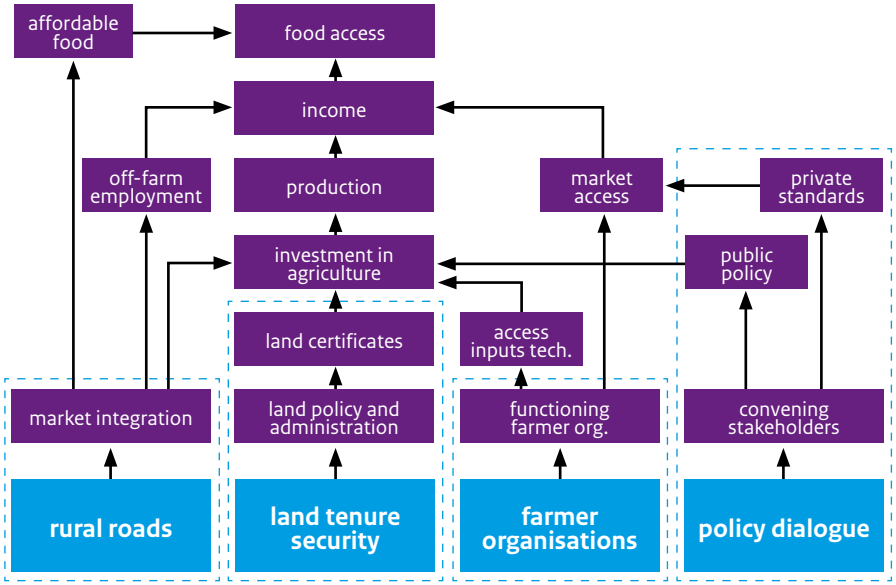
Improving land tenure security (pathway 8) starts with a land policy and formalised administration, and issuing land certificates to individual farmers. The idea is that this reduces land disputes, and secures land use rights or land ownership.[79] This is expected to facilitate land transfer (by rental or sales) to more productive users, and encourage

[79] There is a difference between *use* certificates (for example in Ethiopia), where land cannot be sold, and land *ownership* certificates (more common in Rwanda), where land can be sold.

long-term investment in land and agriculture. This may contribute to increased food production, income, and food access.

Rural roads (pathway 9) facilitate market integration, which is expected to lead to lower farm input prices and higher farm output prices. This may encourage investment in agriculture and commercialisation, which may result in higher farm productivity. It may also reduce consumer prices of transported food and thus improve food access and facilitate people's mobility for off-farm employment. Besides, by attracting investors into previously more remote areas, roads may generate off-farm employment.

Figure 6.1 *The four pathways contributing to an enabling business environment: rural roads, land tenure security, farmer organisations, and policy dialogue*



Capacity building can improve the functioning of farmer organisations (pathway 10). Well-functioning farmer organisations are expected to be able to facilitate farmer access to farm inputs and to output markets through collective purchasing, marketing, and bargaining. This is expected to encourage investment in agriculture, and increase food production and farmer income.

By convening multiple stakeholders, policy dialogue (pathway 11) can either aim to contribute to better government policies or to improved private production standards or codes of practice. Better public policies can be followed up by national investment plan, benefiting agriculture or other sectors. Better private codes of practice or standards can lead

to improved environmental sustainability of production processes or to better labour conditions. It is expected that this improves farm or labourers' income.[80]

Part of the Dutch expenditure for the enabling business environment is spent on capacity building of governments and private sector, and on education and vocational training, but these two categories were not included in this review.

For this policy objective, we used 15 evaluations, divided over the four pathways and representing in total 52% of the expenditure (see Table 6.1). In addition, we drew on the ample evidence from the broader literature.

Table 6.1 Evaluation coverage (expenditure on evaluated projects / expenditure on all projects) and evaluation quality (policy objective 3)

	Projects total		Projects evaluated			Eval. quality*				Eval. Type**		
Pathway	No.	EUR million	No.	EUR million	cover	C1	C2	C3	C4	MTR	Eval	IOB
8. Land rights	16	50.6	4	33.5	66%	1	2	1	0	2	2	0
9. Infrastructure	19	135.5	4	52.5	39%	1	0	2	1	1	3	0
10. Capacity development of farmer organisations	5	61.8	4	50.8	82%	1	0	1	2	2	1	1
11. Private and public policy dialogue	15	49.6	3	17.1	34%	0	0	2	1	1	2	0
Total	**55**	**297.5**	**15**	**153.9**	**52%**	**3**	**2**	**6**	**4**	**6**	**8**	**1**

** Quality of evaluation: Category 1 is best, see Chapter 2.*
*** Type of evaluation: MTR = mid-term review; Eval. = evaluation; IOB = IOB impact study.*

6.3 Land tenure security (pathway 8)

As access to land and equitable land rights are believed to be essential for agricultural development, in the period 2012-2016 the Netherlands supported a large number of projects (16) intended to secure tenure to land (and other natural resources) for everyone, including the poor, women, youth, and other vulnerable groups (EUR 47 million)[81]. The Netherlands promotes land rights mainly by building organisational, financial, and technical capacity in developing countries. Examples of supported activities that aim to improve the capacity of local organisations are the **Global Land Tool Network** implemented by IFAD (EUR 11.5 million), **Gesterra-Capacity Building for Land Management and Adminstration** (EUR 7.8 million) in Mozambique, **Projet Foncier Local** in Benin (2.5 million), which is co-implemented by VNG International, and the partnership between the Ministry of Foreign Affairs and 'Kadaster' (the Netherlands Land Registry and Mapping Agency) **'Land Administration for National Development'** (EUR 350,000).

[80] It is debatable whether standards improve market access for farmers: they may provide access to high value markets for some farmers, but may also be exclusive for other farmers – see pathway 3.
[81] Unless otherwise indicated, all sums in parentheses refer to expenditure during the review period 2012-2016.

The goal of the Land Tenure Regularisation programme in Rwanda (EUR 9.9 million) was for all rightful landholders in Rwanda (ca. 10 million parcels) to receive legally valid land title documents.

The Netherlands also supported the **International Land Coalition** (EUR 5.1 million): an international organisation for lobby and advocacy on land rights, which aims to influence the formulation and implementation of national land policies for the benefit of poor rural people. Many of its initiatives also promote land rights specifically for women, leading to better access to productive resources for female-headed households.

Traditional land tenure, still present in rural areas in many African countries, in which village chiefs are the custodians of land, used to work well in situations of limited land pressure and little movement of people. However, with increasing land pressure, migration, urbanisation, and investors (foreign or otherwise) in agriculture, land tenure security deteriorates and disputes over land arise. In such cases, a more formalised system may be needed to assure land tenure security.

The main assumptions underlying this impact pathway include: (1) certification assures land tenure security, also for vulnerable groups; (2) secure land rights are a prerequisite for farmer investment in sustainable land management and productivity (in this sense secure land rights are also a prerequisite for pathways 1-3); (3) land certificates also facilitate land markets and transfer of land to more efficient land users, with rental markets expected to contribute to income diversification and temporary migration and to have an equalisation effect, while land sales markets are expected to contribute to structural transformation and outmigration; and (4) formal land transactions are affordable for smallholder farmers.

Evidence

Three evaluations report at institutional outcome level (in accordance with the project's ambitions). The evaluation of the Rwanda Land Regularisation Programme also presents impact at household level.

The evaluation of the International Land Coalition concludes that thanks to its network of member civil society organisations and a coherent approach, the lobby has had a positive effect on national government land policies (Zuijderduijn et al., 2015).

The mid-term review of the UN's Global Land Tool Network shows that the tools, policies, and guidelines developed have influenced global land policy frameworks: for example, in the formulation of the FAO's *Voluntary Guidelines on the Responsible Governance of Tenure of land, fisheries and forests in the context of national food security* (VGGT) of 2012, as well as in their implementation at country level (Brand et al., 2015a). The network has also contributed to the inclusion of land indicators in the SDGs. However, donors are still not sufficiently considering land tenure and still not using the available land tools in their agricultural programmes, and the use of land tools is not well monitored.

The mid-term review of the Land Management and Administration Programme in Mozambique convincingly shows an improved capacity of the land administration, and improved land right certificates in which both the man and the woman are registered, hence assuring women's land rights, but also concludes that too little effort has been made to improve land use planning and farmers' land management (Christoplos et al., 2016).

The Land Regularisation Programme in Rwanda has been subjected to much scientific research since the start of the pilot phase in 2007. A series of studies shed light on the effects and the validity of the underlying assumptions. The evaluation of the pilot phase (2007-2010), which involved 15,000 land parcels, showed that land certificates: (1) encouraged farmers to invest in soil and water conservation, the adoption of which has doubled (and even tripled under female-headed households); (2) improved land access for legally married women; and (3) did not result in distress sales or widespread landlessness of vulnerable people (Ali et al., 2014). However, women who were not legally married did not benefit, due to a misinterpretation of the land laws, which was corrected in the roll-out phase.

In the roll-out phase, between 2010 and 2013, about 11 million parcels were demarcated and adjudicated, at a cost of about USD 5 per parcel. In spite of efforts to include poor people and women, they were underrepresented. Daughters were less likely to inherit land than sons, due to cultural and social norms. Additional (donor-funded) awareness activities mitigated this gender and wealth bias (Santos et al., 2014). In contrast with the pilot phase, women who were not legally married benefited too, but less than legally married women (Ali et al., 2015a).

The land certificates have encouraged land rental and land sales markets. The *rental* markets in particular contribute to an equalisation of land endowments and more favourable land-to-labour ratios: a transfer of land from older, wealthier farmers to young, mainly male, poorer farmers with more dependent children. The assumption that land markets result in a more efficient land distribution is thus validated for rental markets. This is barely the case for the land sales market because – as expected – buyers are relatively richer. Female-headed households participate less in land markets, and if they do, they more often rent out land than then rent in. This is not necessarily a negative effect, however, as it provides them with income while they retain ownership of the land, which acts as a safety net (Ali et al., 2015b).

In contrast with the positive effects of the land *rental* market, the land *sales* markets in Rwanda has gradually reverted to the informal system. Most farmers who sold their land after initial registration did so without going through the formal land administration. This undermines the sustainability of the formal land administration and information system. The formal system of land sales is expensive (USD 40 for a transfer registration, about 23% of the value of an average rural plot). Furthermore, subdividing plots smaller than 1 ha (which is common with inheritance) is prohibited by law (Ali et al., 2016). Other research in Rwanda has shown that the perceived disadvantages of land fragmentation (the reason for the government prohibiting parcel sub-division below 1 ha) are invalid: households with

many smaller plots are less prone to risk of crop failure and produce at least as efficiently as households with fewer, larger plots (Ali et al., 2015c).

One systematic review examined 20 good quantitative studies on the effects of land certification on agricultural investments and productivity. Five were in Asia, five in Latin America and ten in Africa (Lawry et al., 2017). In addition, nine good qualitative studies were used to investigate underlying processes and the effects on non-beneficiaries in the wider population. It is important to distinguish the results in Asia and Latin America (where mostly freehold land (ownership) titles were issued in a context without customary land use rights) from those in Africa, where often traditional land use rights were converted into land ownership titles, long-term leasehold, or formal registration of customary land rights.

Overall, the land tenure interventions resulted in better tenure security, which encouraged long-term investments in land (+5%), resulted in higher agricultural productivity (+40%) and raised household consumption, expenditure, and income (+15%). No effects on access to credit were found. The productivity gains were much smaller in the African context than in Asia and Latin America. The Africa studies did not provide information on household income or consumption. The authors formulated three hypotheses to explain why the effects in Africa are less than in Asia and Latin America: (1) the traditional customary land tenure system in Africa assures sufficient tenure security; (2) African farm households lack resources for investment; and (3) complementary public investments, in roads, markets, and training are lagging behind in Africa.

The qualitative studies point at possible negative effects: displacement of people with less secure land rights, and reduced rights for women. Some land users in the population miss out on the land registration.

Another systematic review (Payne et al., 2015) concluded that although land titles encourage investment by the owner, they may also undermine the rights of those with informal tenure. Women may miss out if the land is only registered in the name of the husband. Land titling may not be appropriate in areas where customary tenure still exists. Land use certificates achieved positive development outcomes at much lower costs than land ownership certificates (i.e. freehold titling).

Securing land tenure is also important to protect local land users against expropriation by foreign investors. The qualitative studies point at possible negative effects: displacement of people with less secure land rights. A systematic review (Tanner et al., 2015) looked at 20 studies in which public ODA support was given to investment projects supported by country governments. Without ODA assistance, foreign direct investors in agriculture often fail to respect local land rights, especially where governments are weak and where investors can easily agree with the local elite, bypassing the local land users. If donors collaborate with the private sector and stress the use of the FAO voluntary guidelines on land rights (VGGT) and agricultural investments (RAI), local land rights are better respected, but are still not guaranteed. Donors may even have a negative effect: for example, by pushing for customary land rights to be converted to land ownership rights. One of the studies in the review was

'Mali Biocarburant', in which farmers were supported to grow jatropha for an oil-extracting facility. The study concludes that in this case the traditional land rights were protected through an inclusive business approach: land used by the project is still owned by the individual farmers and the Malian farmers union has a 20% stake in the company.

In conclusion, evaluations of the land tenure security programme in Rwanda co-funded by the Netherlands show an impressive and cost-effective coverage of farm households with land titles, which has improved land tenure security and increased investment in land management practices (soil and water conservation). Women have also benefited. After initial registration, land *rental* markets work well and result in a transfer of land use from wealthier, older farmers to young, poorer farmers with abundant labour. However, the formal land *sales* markets do not work well, due to high transaction costs and the legislation preventing the division of land under 1 ha. Farmers therefore revert to informal land sales markets, undermining the sustainability of the new land tenure system. The broader literature shows that in Africa there is hardly any evidence of increased production and income, most likely because the traditional, informal system worked reasonably well. The situation in Africa may change with increasing migration and large-scale investment (foreign or otherwise) in land. In contrast, the effects of land titling in Asia and Latin America are large: households have a much higher production and higher income. Several studies warn that certain less privileged groups easily miss out from land titling programmes and that unless accompanied by other conditions (markets, credit, inputs), land tenure security will not affect production.

6.4 Infrastructure: feeder roads (pathway 9)

In many developing countries there is a shortage of roads, with the biggest shortage in sub-Saharan Africa. In countries such as Tanzania, Mozambique, Ethiopia, and Zambia, less than 25% of the people in rural areas live within 2 km of a road that is in good condition (Iimi et al., 2016). On average, less than 16% of the roads in sub-Saharan Africa are paved.[82] Despite renewed interest in infrastructural investments by governments and donors, this shortage of infrastructure is predominantly caused by a lack of financial means (IOB, 2014b).

Between 2012 and 2016, the Netherlands spent EUR 128 million of the food security budget on projects that invest in rural infrastructure.[83] Mostly this concerned investments in roads, but there was also some investment in irrigation, electricity, market places, water, sanitation, and even school and healthcare buildings. With regard to road infrastructure, the Netherlands particularly supported projects in remote rural areas and the construction of feeder roads (as opposed to main roads).

Through its food security budget the Netherlands has invested particularly heavily in infrastructure in **Rwanda** (EUR 77.7 million), but has also supported **feeder road construction in Benin** (EUR 22.5 million) and **South Sudan** (EUR 12.5 million) and two

[82] Data obtained from http://datatopics.worldbank.org/jobs/region/sub-saharan-africa, accessed on 24 May 2017.
[83] Much more is spent on infrastructure, roads, and rural finance from the private sector development budget.

projects in the **Palestinian territories** that invested in irrigation, land preparation and roads (EUR 9.9 million).

The rationale behind investing in feeder roads is that it reduces transport costs and thereby improves market access for everyone. On the one hand this is expected to lead to lower (and more stable) food prices for the people in the targeted area, in the rest of the country and beyond. On the other hand, this is expected to increase access to inputs for farmers (and to improved use of technologies, higher production, and higher incomes) and to increase private investments in the region. These investments and the improved mobility of people facilitate off-farm employment.

Evidence

Four evaluations and one project completion report of Dutch-funded projects in various types of infrastructure are available, two of which are evaluations on rural roads, in Benin and Rwanda.[84] According to its project completion report the feeder roads consolidation programme (PDED 2) in Rwanda has rehabilitated 521 km of roads and has created 26,000 temporary low-skilled jobs (Helpage Rwanda, 2014). Another 89,725 jobs are reported to have been created by the support to the Local Administrative Development Agency, which invests in a wide range of infrastructural projects (CDP, 2016).

The *Pistes Rurales* project in Benin is the only road investment project that has evaluated its effectiveness (Durero et al., 2015). Through this project the Netherlands invested in more than 10,000 km of rural roads. The evaluation concluded that this led to reduced input costs and higher investment in cash crops by farmers. Moreover, the evaluation found plausible evidence that farm gate prices had increased as a result of the project.

Recently, Hine et al. (2015) conducted an extensive systematic review on the effectiveness of road investments in developing countries. They confirm that road investments do indeed reduce transport costs. In addition, they present strong evidence that over the medium to long term this leads to increased agricultural performance (better access to agricultural inputs, higher prices for farmers and higher agricultural production), higher non-agricultural employment and, ultimately, a higher income for people in the vicinity of the road.

To our knowledge there are no studies available that investigate the effect of road infrastructure on food security. However, recent evidence from Ethiopia suggests that households with lower transaction costs to reach the nearest market are more likely to be food secure and have more diverse diets (Stifel and Minten, 2017). Moreover, the low-skilled employment created by constructing or maintaining roads offers opportunities for food-insecure households to improve and stabilise their income.

Perhaps not surprisingly, Hine et al. (2015) also find that investments in road infrastructure have the highest impact in countries or regions that currently have the lowest road densities. Moreover, investments in feeder roads are found to provide greater social welfare

[84] One evaluation, on access to energy in Rwanda, is part of the IOB evaluation on renewable energy, and not discussed here.

gains than higher standard paved roads. For example, Fan et al. (2004) suggest that investment in feeder roads is three times as cost-effective in lifting people out of poverty as investments in higher standard gravel or tarmac roads.

In conclusion: in the period under review, the Netherlands invested in the rehabilitation of rural roads, often by using low-skilled labour. Only one project evaluation, in Benin, looked at effectiveness, reporting that this had improved the market integration of farmers, who received higher prices for their products and paid lower prices for farm inputs, which encouraged and increased agricultural production. The broader literature convincingly confirms these positive effects on markets, farm input and output prices, agricultural production, mobility, non-farm employment, and food security.

6.5 Capacity development of farmer organisations (pathway 10)

The Netherlands has mainly supported farmer organisations through the **Program Support to Producer Organisations** implemented by Agriterra (EUR 38.6 million) and the support to **Farmers Fighting Poverty** programme by Agricord (EUR 11 million).[85] Both programmes are primarily intended to strengthen the financial, institutional, and technical capacity of producer organisations by drawing on the experience of farmer organisations in OECD countries. [86]

There are also a few embassy-funded projects that primarily follow this approach, such as the **Linking Farmers to Markets Programme** (EUR 3.6 million) and **Cooperatives Support Programme** (EUR 2.1 million) in Rwanda, and the **Dairy Agribusiness** project in Uganda (see Box 6.1). Moreover, many of the projects that follow the value chain development pathway (2) include setting up producer groups and building their capacity.

Through these programmes, the Netherlands mainly intends to improve the bargaining power of farmers in the value chains in which they are active (vis-à-vis input and service providers and buyers of produce) as well as in the political arena (vis-à-vis policy makers). Moreover, collective action might be necessary for farmers to gain access to certain farm inputs and services and to high value output markets. A better bargaining position and better access to markets is expected to lead to a more favourable policy environment, improved farm technology, higher producer prices, and higher farm income.[87] The ultimate

[85] AgriCord is a network of 'agri-agencies', non-governmental organisations for development cooperation with structural links to the farmers' and rural members' organisations in their home countries (eight EU Member States, Canada, Senegal, and Asia). One of its members is the Dutch agri-agency Agriterra.

[86] Note that capacity building support to civil society organisations and NGOs, which also includes some support to farmer organisations, is largely funded through Dutch NGOs from a separate policy budget line (lobby and advocacy) not covered in this policy evaluation.

[87] Not all financed projects in this pathway included these outcomes as explicit objectives. Two of the largest projects within this pathway, however (the programme by Agriterra and the Agribusiness Dairy project in Uganda) do have the explicit objective to contribute to this level of outcome.

idea of many of these programmes is that stronger rural membership organisations contribute to enhanced democracy and to sustainable and inclusive rural development.[88]

Evidence

The projects together have reached about 3.3 million farmers, most of whom have been reached via the Agriterra programme. These are self-reported numbers, however, and to some extent intentions instead of realisations. The beneficiaries of these activities tend to be the more entrepreneurial and better-off farmers. The evaluation of the Agriterra programme, for example, states that farmers with little opportunity to become more entrepreneurial might have been excluded as a result of this focus (KIT, 2015).

According to project evaluations, the programmes in general have succeeded in strengthening farmer organisations in developing countries. The evaluation of the Agriterra programme reports that supported organisations show an increase in members, an increase in volumes sold to the cooperative, and an increase in service delivery by the cooperative.[89] However, the evaluation also indicates that economic sustainability, especially for the more traditional cooperatives, remains a key challenge, as many groups lack sufficient income (in the form of membership fees or levies on sales) and depend on public support to cover the operational costs of their service provision.

Similar but less positive results are reported by the mid-term review of the cooperatives support programme in Rwanda, implemented by SPARK, which indicates that although the intervention was improving the functioning of the participating cooperatives at an administrative level, the commitment and ownership by members was still low (Friends Consultant LTD, 2015). This is explained by the finding that the formation of the cooperatives was not driven by the common interests among the members but instead by government policy. As a result, a number of these cooperatives have failed to achieve tangible values and are seeing a decline in membership.

Only the evaluation of the aBi-trust Dairy project in Uganda provides credible information on the effectiveness of supporting farmer organisations, in terms of outcomes at household level (see Box 6.1) (AIID-PwC, 2017b).

[88] See, for example, the activity appraisal document of Agricord and the evaluation of Agriterra.
[89] The evaluation of Agriterra could, however, not unequivocally attribute these improvements to the programme.

Box 6.1 *Impact evaluation of Dairy Agribusiness Project implemented by aBi-Trust in Uganda*

Based on the IOB-commissioned country report: AIID-PwC, 2017. Evaluation of the Dutch food security programme in Bangladesh – including an impact study of the aBi Trust dairy project.

Background: This dairy development project was implemented by aBi Trust. It is one of the decentrally-funded projects whose effectiveness was evaluated in-depth by IOB. The objective of the project was to improve the functioning, capacity and bargaining power of the Uganda Crane Creameries Cooperative Union (UCCCU), its cooperatives and its 18,000 dairy farmer members. Before the project, UCCCU cooperatives depended on milk coolers owned by a privatised milk processor, Sameer, which reduced the bargaining power of the cooperatives: they paid rent, received lower prices, and milk was more often rejected.

Result chain: the project expected the following effects: (1) new equipment, mainly milk coolers and trucks and milk cans for transport, would improve the bargaining power of the cooperatives, which would be able to sell to different buyers, for higher milk prices; (2) the additional milk-cooling capacity would enable the evening milk to be collected too and thus would increase the volume of milk sold through the cooperatives; (3) various training events on about milk hygiene, feeding, etc., would improve the milk quality and reduce the amount of milk rejected; (4) this would increase farmer income from milk, which could eventually trigger farmer investment in increased production; (5) on the one hand, the new, energy-efficient equipment would save the cooperatives money; on the other hand, half the cost of the equipment was a gift but the cooperatives took out a loan for the remaining 50%, which was repaid by deducting UGX 50 from the per litre payment to member farmers.

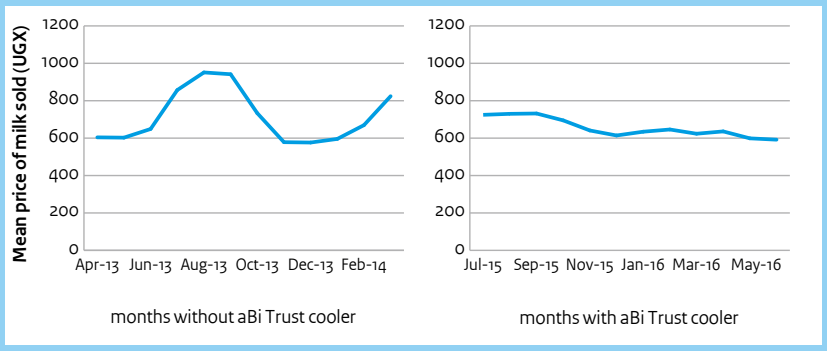
Evaluation: The evaluation compared the 36 cooperatives and their members who received a new cooler between 2014 and 2016 with nine 'control' cooperatives that did not receive an additional cooler in that period, and compared the situation in 2014 with the situation in 2016. An additional analysis was done comparing the price and volume just before and just after the installation of the milk cooler.

Membership and farm practices: The project activities made the cooperative popular among farmers and increased the percentage of dairy farmers who are members from 55% to 85%. Farmers in the beneficiary cooperatives participated more in training, gained more knowledge and adopted more recommended practices.

Sales and milk prices: Although the project did indeed lead to more sales from the cooperative to alternative milk processors (besides Sameer), there was no effect on milk prices, i.e. the trends in prices received by supported cooperatives did not differ from the trend in prices received by other cooperatives. On top of that, member farmers received a lower milk price because of the UGX 50 deduction for reimbursing the cooperative's loan for the cooler. Repayment of this loan was

particularly problematic for cooperatives with low milk volumes. The comparison of price in the 12 months before cooler installation with the 12 months after cooler installation did show an effect: price fluctuations decreased (Figure 6.2).

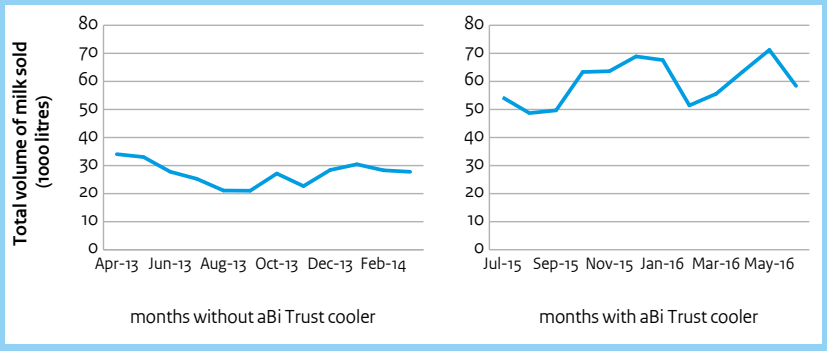
Figure 6.2 *Price fluctuations in the 12 months before (left) and after (right) installation of a new milk cooler*



Note: only cooperatives that received aBi Trust cooler included.

Milk volume sold: Contrary to the expectations of the project, the increased milk cooling capacity did not lead to the collection of evening milk and consequently neither did it result in a larger milk volume collected. Evening milk (often this is a smaller quantity) is still used for home consumption and for feeding calves. The farm household's consumption of milk increased a little, but total milk production per farmer did not change. The comparison of volume in the 12 months before cooler installation with the 12 months after cooler installation does show some effects: the volume sold by the cooperatives increased (Figure 6.3), but when comparing different cooperatives, the average effect was not significant.

Figure 6.3 *Milk volume sold in the 12 months before (left) and after (right) installation of a new milk cooler*



Note: only cooperatives that received aBi Trust cooler included.

Explanatory factors: a number of factors may explain the limited results:

- *Context*. An important context factor was the new milk processor, Pearl, buying directly from farmers, UCCCU members and others, and thus competing with the cooperatives for their members' milk. The project assumption that new coolers would increase bargaining power may have been valid during project design, but was no longer valid when this competitor came onto the scene. Note that Pearl was supported by the Netherlands with a loan from GAFSP, which assisted the dairy farmers in the area by improving their better bargaining power.
- *Project design*. The assumption about cooling capacity facilitating the collection of evening milk turned out to be wrong. There may have been a substitution effect: where new coolers were installed, coolers owned by Sameer may have been taken away. This was not well monitored and so this hypothesis was not tested.
- *Project implementation.* The requirement to contribute 50% of the cost of the coolers turned out to be beyond the capability of cooperatives with a smaller turnover of milk volume, which resulted in them paying too low prices to farmers, which in turn resulted in side selling by farmers to other milk buyers. It may take some time before all new cooler capacity is effectively used.

In the broader literature there is also little rigorous evidence available on the effectiveness of public interventions that strengthen farmer organisations. Studies do confirm that successfully strengthening farmer organisations is a difficult and long process requiring considerable resources, even under favourable conditions (Donovan et al., 2017). The difficulty lies in making farmer organisations autonomous and economically sustainable yet still inclusive for smaller and poorer farmers (Donovan and Poole, 2014). Becoming autonomous often requires reaching a financial threshold where the cooperative has built up sufficient capital to be able to guarantee certain services (e.g. advance payments) even in volatile conditions. Donovan et al. (2017) find that in the case of Peru, many of the successful cooperatives received considerable outside support (mainly financial), especially during the incubation phase, which allowed them to grow and compete. Other conditions for success included strong and capable leadership (human capital) and trust among stakeholders (social capital).

Once cooperatives are functioning well, they can provide tangible benefits for their members. A number of studies showed that cooperatives can improve access to agricultural technology and access to output markets (including to high-value output markets) and can increase output prices for participating farmers.[90, 91]

[90] For example, Abebaw and Haile (2013), Chagwiza et al. (2016), and Verhofstadt and Maertens (2014a) show that cooperatives can improve access to technology; Kaganzi et al. (2009), Moustier et al. (2010), and Wollni and Zeller (2007) show that cooperatives can improve access to (high-value) output markets; and Bernard et al. (2008), Chagwiza et al. (2016), and Fischer and Qaim (2012) show that cooperatives can increase producer prices.

[91] A positive effect on higher producer prices may not necessarily be due to farmers' enhanced bargaining power. Price levels are likely to depend on the quality of the produce, the type of product, and the level of transaction costs. These factors are all potentially influenced by the cooperative and therefore do not necessarily result from improved bargaining power.

The broader literature thus confirms the validity of the Dutch intervention logic for supporting farmer organisations: (1) outside support seems key to establishing inclusive and functioning farmer organisations and (2) functioning farmer organisations can generate value for their members. These results are, however, not sufficient to suggest that cooperatives can improve the incomes of poor farmers. To achieve this, poor farmers should be able to participate in cooperatives and this should improve their income.

Quite a few studies have investigated the extent to which poor farmers participate in cooperatives. Most studies agree that asset-poor households are less likely to join a cooperative (e.g. Bernard and Spielman, 2009; Fischer and Qaim, 2012; Ito et al., 2012). Social capital, human capital, landholdings, location, and access to finance all seem to be constraints. Moreover, in some cases a land holding of a minimum size is an explicit entry criterion for joining a cooperative, which suggests that such cooperatives are actively excluding the poor (e.g. Ito et al., 2012).

Only a few studies have shed light on the income and poverty effects of cooperative membership. Ma and Abdulai (2016) estimate that cooperative membership increases the income of Chinese apple farmers that own less than 0.4 ha by 5.7%. This is more, in relative terms, than the impact on medium- sized (4.6%) and large farmers (3.8%). Ito et al. (2012) find that smaller farmers benefit more than large farmers, both relatively and in absolute terms. They estimated that cooperative membership increases the farm income of small farms by USD 6 per day, which is double the estimate for large-scale farmers.[92] More depth to this question is provided by Verhofstadt and Maertens (2014b), who find that Rwandan cooperatives increase the average income of their members by an estimated USD 155 per year and reduce the likelihood of being poor by an estimated 6.8%. They also find that income effects are biggest for farmers that own about 0.5 ha. For farmers owning less or more than that, cooperative membership is less effective. Importantly, they also find that cooperative membership is ineffective in reducing poverty for land-poor households (<0.15 ha) because the impact on their incomes is not high enough to outweigh the additional costs of participation.

In conclusion, evaluations of Dutch-supported projects show that capacity building of producer organisations had resulted in increased membership, increased service delivery to members, and increased volumes of farm produce sold, which can be seen as proxy indicators of the organisation's capacity. The impact evaluation of the dairy cooperative in Uganda also showed that the project increased membership and services to members, but did not lead to improvement of production, sales, or income for member farmers. The broader literature shows that there are two types of producer organisations: (1) more commercially oriented, with better-off, medium-sized farms, which are successful in adopting new technologies and increasing their members' sales and income; these organisations become more autonomous after initial support; and (2) more socially-

[92] Ito et al. (2012) report an estimate of CNY 41 per day. We converted the estimate to dollars using the exchange rate at the time of the survey (March 2009): CNY 1 = USD 0.146.

oriented organisations, which are more inclusive of poorer farmers but have less effect on sales or income, and often remain dependent on external support.

6.6 Public and private multi-stakeholder policy dialogue (pathway 11)

Dutch food security policy includes activities that facilitate a multi-stakeholder dialogue to come to better and more widely supported government policies (e.g. on agriculture or trade) and better company policies (e.g. about standards or codes of practice). The involvement of government, private sector, knowledge institutes, and civil society organisations – including farmer organisations – in dialogue and agreements about practical solutions, strategies, or policies, is referred to in the Netherlands as the 'Dutch diamond approach'. Giving room for private sector and civil society often requires government organisations in developing countries to change their attitude and culture.

Examples of the 15 activities that follow this pathway are the multi-donor trust fund (MDTF) support to Comprehensive Africa Agriculture Development Programme (CAADP), which develops agricultural policies in Africa; support to the Ethiopian Horticultural Produces and Exporters Association (EHPEA); support to Agriprofocus, which organises exchanges between Netherlands-based organisations supporting farmer organisations in the South; and the voluntary contribution to FAO work on global dialogue for policies and strategies. Multi-stakeholder dialogue is not only found in a set of separate projects presented in this pathway but is also an approach cutting across other pathways. For example, projects such as IDH (discussed under the value chain development pathway) also include an elaborate multi-stakeholder process to pilot best practices and develop standards on environmental and social sustainability.

In addition, the Dutch embassies in partner countries are important in facilitating multi-stakeholder policy dialogue: for example, involving local and Dutch private sector and civil society when discussing policies with government and other donors. In some partner countries, for example in Ethiopia and Rwanda, an agricultural attaché from the Dutch Ministry of Economic Affairs is based at the Dutch embassy, who looks for opportunities for Dutch and local private sector and trade and can discuss with policy makers the challenges encountered by the private sector.

In policy dialogue it is crucial to involve the different stakeholders so that the resulting public or private policy will be more widely supported and is more likely to be coherent and effective. Exchange visits and pilot activities can inform the policy dialogue. The main assumptions are: (1) the government is willing to reach a consensus with other stakeholders, private sector, and civil society; (2) companies are willing to make an extra effort to invest in social and / or environmental sustainability; and (3) there is political will and follow-up funding, public or private, to put the agreed policies or standards into practice and to scale them up.

Evidence

Four activities have been assessed: the CAADP MDTF evaluation (Gerrard et al., 2016); the mid-term review of PASIC in Uganda (Bakema and Drazu, 2015); the support to EHPEA in Ethiopia reviewed as part of the IOB country study (Ecorys-WUR-NMA, 2017); and the IOB review of FAO and its role in policy dialogue included in the IOB evaluation of the UN (IOB, 2017). The role of embassies in policy dialogue was discussed during the IOB visits to the four case study countries.

Public policy dialogue

The evaluations show three examples of supporting public policy dialogue. CAADP supports African governments in setting up national (and regional) policies for agricultural development. The resulting policy document, the 'Compact', is the starting point for a more detailed National Agricultural Investment Plan (NAIP), that helps governments to seek funding (e.g. from the public window of the multi-donor GAFSP). The policy formulation is an inclusive process that brings together all stakeholders (including non-state actors) and is supported by technical assistance, capacity building, and information sharing. The evaluation of CAADP MDTF showed that between 2008 and 2015, 40 countries had signed a CAADP Compact; 37of these had completed Independent Technical Reviews of their NAIP. As a consequence, 15 countries received multi-donor GAFSP grants for their investment programmes, totalling USD 586 million in 2014. In contrast, the NAIP received little support from the national budget.[93] Most dialogue still took place within and between governments, with limited involvement of private sector or civil society.

The objective of PASIC, a project implemented in Uganda by research institute IITA, was to collect research results and evidence for better policies on agricultural intensification, with a focus on seed, fertiliser and extension; and on zonal investment plans. The mid-term review found some positive effects: there was a strong link between research and government policy; there had been multi-stakeholder workshops, but the involvement of private sector and civil society was still limited, and occurred late in the policy dialogue process. PASIC advised government during the development of a new seed policy, and lobbied for issuing licences to the private sector, for importing inputs. However, the review also concluded that the research and value chain analyses were too simple and sometimes of low quality, and that capacity building of staff at the Ministry of Agriculture in Uganda was not sufficiently tailored to their specific needs. Action plans for value chain development had been made without sufficient involvement of the private sector. It was considered unlikely that the project would result in good quality policies or zonal investment plans.

[93] Whereas domestic resource mobilisation (10% of the national budget) is one of the main pillars of CAADP. The Malabo declaration of African Heads of State (2014) adopted a more detailed set of goals, including more emphasis on the role of the private sector and trade.

The Netherlands supports FAO through voluntary contributions and a few projects at country level. Two of its key roles, according to the Dutch 'FAO Scorecard 2015', are its functions as a global platform for policy and strategy and in national policy dialogue. The IOB UN evaluation (2017) confirmed and appreciated FAO's strength and unique role as a global convener, of governments, experts, scientists, private sector, and civil society in the area of agriculture and food security strategies and policies. FAO is an impartial partner, legitimate because nations are member of this intergovernmental organisation, and able to depoliticise issues. The Committee on Food Security hosted by FAO recently released two products of a global consultation process, which are also relevant for the Dutch emphasis on including the international private sector in trade and investment in agricultural development: (1) the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forest in the context of national food security – VGGT (CFS, 2012); and (2) Principles for Responsible Agricultural Investment in Agriculture and Food Systems – RAI (CFS, 2014). At the national policy dialogue level, the results are mixed, but improving. An evaluation of 2012 found that despite its unique position, FAO was often insufficiently engaged in national policy dialogue. The Dutch embassies in the four case study countries attach varying importance to the FAO for policy dialogue (more in Bangladesh, less in Uganda). However, recently FAO has put more emphasis on national policy dialogue and has placed policy experts in 34 countries through the EU-funded FIRST project.

Private policy dialogue

The available evaluations include two examples of private policy dialogue. During the period considered for this review, the Netherlands embassy in Ethiopia supported the EHPEA through the Ethiopian Dutch Horticulture Development Programme (ED-HDP). The ED-HDP objectives were: public-private policy dialogue for an enabling business environment for increased investment and innovations; development of production standards for better labour conditions and income for labourers; and reduced pesticide use (IPM) and water pollution. The multi-stakeholder dialogue included Ethiopian and Dutch private sector and knowledge institutes, and the Ethiopian government.

The country study review and interviews by IOB with EHPEA found that the ED-HDP resulted in a logical sequence of piloting, the development of standards, and mainstreaming: with support from the project and universities, a few farms reduced pesticide use and agreed on a benchmark of best practices, and then EHPEA took over the benchmark as a voluntary code for all their member farms. The Ethiopian government, interested in reducing water pollution, was planning to make this mandatory for all horticultural farms in Ethiopia. The potential impact is large, as the country has 118 farms employing over 100,000 labourers, mainly women, but this social, environmental or employment impact has not yet been studied.

A second example is the Sustainable Trade Initiative (IDH), which IOB reviewed in 2014 (IOB, 2014a). Part of IDH's work on sustainable value chains was convening and facilitating multi-stakeholder dialogue to analyse sustainability issues, propose and test solutions, and develop codes of practice and production standards. This dialogue took place between companies, a 'coalition of the willing', in a pre-competitive arena, often with participation

of government and NGO representatives. The review concluded that in contrast to some of the direct support to individual companies, this convening work in the precompetitive space was much appreciated in the sector and has indeed speeded up the development and adoption of sustainability standards such as those of UTZ cacao, Better Cotton, and the Aquaculture Stewardship Council.

The role of embassies in multi-stakeholder dialogue
The Dutch embassies play a role in multi-stakeholder dialogue by participating in government–donor sector working groups and by putting issues brought up by the private sector or by civil society on the agenda in these government–donor fora. The level of embassy participation and initiative in these fora greatly depends on the staff capacity and time. In the four case study countries, we came across the following examples of policy dialogue and results.

In Rwanda, the Dutch embassy saw the need for a food and nutrition secretariat bridging the distinct and incoherent policies from the ministries of agriculture and health. The Netherlands first lobbied for and then supported this secretariat. The agricultural attaché in Rwanda plays an important role, lobbying the government to create space for private sector involvement, including Dutch private sector. The embassy is represented in the EU-chaired Private Sector Development working group, where, for example, it has expressed concern about the Rwanda government's decision to transfer fertiliser distribution from the private sector to the army (after fraud with subsidised fertiliser). Creating space for the private sector has been a frustrating process because the government has been reluctant to relinquish control to the private sector, as that may become economically and politically important. Promises to foreign investors have often not been kept.

In Ethiopia, the Dutch embassy initiated (in 2008) and financially supported the Sector Working Group of Rural Economic Development and Food Security, which has been influential in the formulation of policies and strategies (particularly the Agricultural Sector Policy and Investment Framework (PIF)), in the design of large projects and programmes with multi-donor financing mechanisms (e.g. the AGP, PSNP and HABP), and in improving coordination and harmonisation. The embassy has also participated in the Sector Working Group for Disaster Risk Management and Food Security, which allows for policy dialogue and monitoring. However, due to changes in staff and limited staff capacity, the embassy's participation has diminished since 2013. Via the agricultural attaché, the embassy has addressed a number of challenges for the Dutch and Ethiopian private sectors: (i) the establishment of a potato business platform; (ii) stimulating the Ethiopian government to streamline procedures, remove bureaucratic hurdles, and solve land rights issues; (iii) commissioning an inventory of obstacles facing Dutch horticultural companies; (iv) facilitating a regular dialogue between Dutch companies and the Ethiopian Revenue and Customs Authority; (v) organising trade missions (spices, logistics, oilseeds, and pulses); and (vi) publishing various business opportunity reports on value chains and Ethiopian regions.

In Bangladesh, the Dutch embassy has been involved in donor coordination since 2010 through participation in the Local Consultative Group (LCG) Water, the LCG Gender, the LCG Health, Nutrition and Population, and the LCG Governance. It has also initiated contact with the FAO with regard to food security and agriculture. The evaluation team noted that by chairing the LCG on Food Security, the embassy was very active in coordinating the interventions of development partners. The WFP emphasised that the embassy has played an important role in bringing together development partners around the issue of food safety and has been more constructive than other donors.

In Uganda, the embassy considered policy dialogue to be difficult. The embassy therefore looked for economic opportunities for Dutch private sector by making market scans and organising missions. The embassy-managed projects PASIC and ISSD had resulted in some government policy improvements.

In conclusion, multi-stakeholder dialogue for national government policies is a promising first step of public investment in agricultural development, but a challenge is the reluctance of some national governments to involve private sector and civil society and to follow up policies with national budget funding. The role of the Dutch embassy in the various government–donor sector working groups has been much appreciated, but has been constrained by limited staff capacity.[94] FAO is well positioned for national policy dialogue and is improving its performance in this field – something Dutch embassies could make use of. Multi-stakeholder dialogue for private sector standards for sustainable production was promising in the case of the horticultural sector in Ethiopia and has shown good results as part of the work done by IDH. Dutch embassies are well positioned to achieve stronger involvement of the private sector in policy dialogue, especially where there is an agricultural attaché with strong links with Dutch and domestic private sectors.

6.7 Synthesis

The four pathways contributing to the policy objective 'improved enabling business environment' are very diverse and do not contribute to a single objective.

The Netherlands has spent a large part of the budget allocated to this policy objective on the construction and rehabilitation of feeder roads. One evaluation showed that this has been effective in improving market integration, reducing farm input prices, and increasing farm output prices, thus encouraging agricultural production for the market. The broader literature confirms this is the case for feeder road investments in general, showing that roads improve food access for consumers by reducing prices of transported food, improving mobility and facilitating off-farm employment.

Dutch-supported land tenure security programmes have been effective in improving policies, setting up land administration, and issuing certificates to farm households. In Rwanda, a number of rigorous impact studies have shown that land certificates have

94 This finding is confirmed by the recent OECD Development cooperation peer review of the Netherlands (2017).

resulted in tenure security, investments in land management, and in a land rental system that increases access to labour-abundant but land-poor households, but have not yet increased production and income. This contrasts with Latin America and Asia, where the literature shows that land certification programmes have had major effects on production and income. In the literature it is suggested that this may be because in Africa pre-existing traditional tenure systems functioned reasonably well and other constraints limited investment in production.

Capacity building of producer organisations that are already commercially oriented, often with relatively better-off farmers, has resulted in better services for their members and in some cases in market access for farm produce. A longer period of support is often needed to make these organisations autonomous. In contrast, capacity building of producer organisations that are more socially oriented (and therefore more inclusive) may have a role to play in political lobbying, but has been less effective in increasing sales or income for their member farmers; moreover, these organisations have rarely become financially autonomous.

Despite weak involvement of private and civil actors, multi-stakeholder dialogue for public policies has resulted in better policies and follow-up donor funding. Multi-stakeholder dialogue for private sector codes of practice and standards has resulted in the private sector adopting standards improving environmental sustainability and labour conditions; sometimes this has been followed by government regulations. Dutch embassies play an important role in multi-stakeholder dialogue, which is much appreciated but constrained by the embassies' staff capacity. Compared to FAO, the Dutch embassies are particularly well positioned for involving the private sector more in dialogue.

It is worth considering the inclusiveness of the pathways contributing to the enabling business environment. In the synthesis of Chapter 4 we mentioned that compared to more traditional agricultural research and extension interventions, value chain development is not that inclusive of smallholder farmers, but that value chains do address other farmer constraints, such as access to inputs, credit or markets that research or extension do not. The investments in the enabling business environment, for example in land tenure security, rural roads or other infrastructure, or – not mentioned in this report – rural finance, also address some of the abovementioned farmer constraints, but in a more inclusive way than value chain development does.

7

Contribution to food security

7.1 Introduction

The previous three chapters have shown to what extent Dutch-funded projects have contributed to the three objectives of Dutch policy on food security. An implicit but important assumption in this policy is that it will also contribute to shorter- and longer-term global food security challenges: the immediate challenge of reducing hunger and malnutrition, and building sustainable food systems producing sufficient food in a sustainable way to feed the world in the future. The next two sections discuss the contribution of the policy to reducing hunger and malnutrition (7.2) and the contribution to sustainable food systems (7.3). Note that many Dutch food security activities (as well as their evaluations) considered in these two sections have focused not on these more ambitious goals but on direct project and policy objectives. Therefore, the assessments in this chapter inevitably rely less on direct evidence and more on indirect indications provided by other studies and the scholarly literature. As a result, the conclusions refer to the effectiveness of pathways (in general) in their contribution to reducing hunger and malnutrition, rather than to specific projects.

The following conclusions with regard to the three main policy objectives may be drawn from this chapter:

1. Interventions following the pathways under policy objective 1 'increased sustainable agricultural production' have varied in their inclusiveness for food-insecure people and in their nutritional outcomes. Whether interventions contributed to food security depended on the chosen target group, product, market and final consumers – choices that were not always *nutrition-sensitive*.
2. Interventions following the pathways under policy objective 2 'improved access to nutritious food' have been inclusive for food-insecure people, are often *nutrition-specific* and have clearly contributed to reduced hunger and malnutrition.
3. Interventions following the pathways under policy objective 3 'enabling business environment' have mainly facilitated the work done under the first policy objective. Some pathways (e.g. roads and land rights) have been inclusive for food-insecure people and can be expected to have directly contributed to reduced hunger and malnutrition. The contribution of all these interventions to sustainable food systems is not yet clear.
4. A long-term focus on the food system as a whole, from production to consumption, has not yet been firmly embedded in the policy, although the portfolio does include a few good examples of combining a food systems approach with addressing sustainability challenges.

7.2 Contribution to reducing hunger and malnutrition

7.2.1 Assessment of the policy objectives' contribution to reduced hunger and malnutrition

Following the World Food Summit declaration on food security (1996), there has been agreement on the four different aspects that need to be addressed for the eradication of hunger and malnutrition (see e.g. FAO, 2006):

1. *Availability*: the quantity of food available, often presented at country level, considering domestic production, domestic stocks, import and exports and, if applicable, food aid.
2. *Access:* physical access to food, whether home-produced or accessible thanks to purchasing power that allows food to be bought on the market. Access often refers to access at household and individual levels.
3. *Stability*: long-term environmental sustainability of the production systems as well as resilience in hard times (such as drought). It can refer to the household level as well as to the landscape.
4. *Utilisation:* the consumption of nutritious food and biological use of food, resulting in a good nutritional status. Utilisation is also affected by water, sanitation, and child and health care.

The policy objectives have clear connections to these four food security aspects (Figure 7.1):

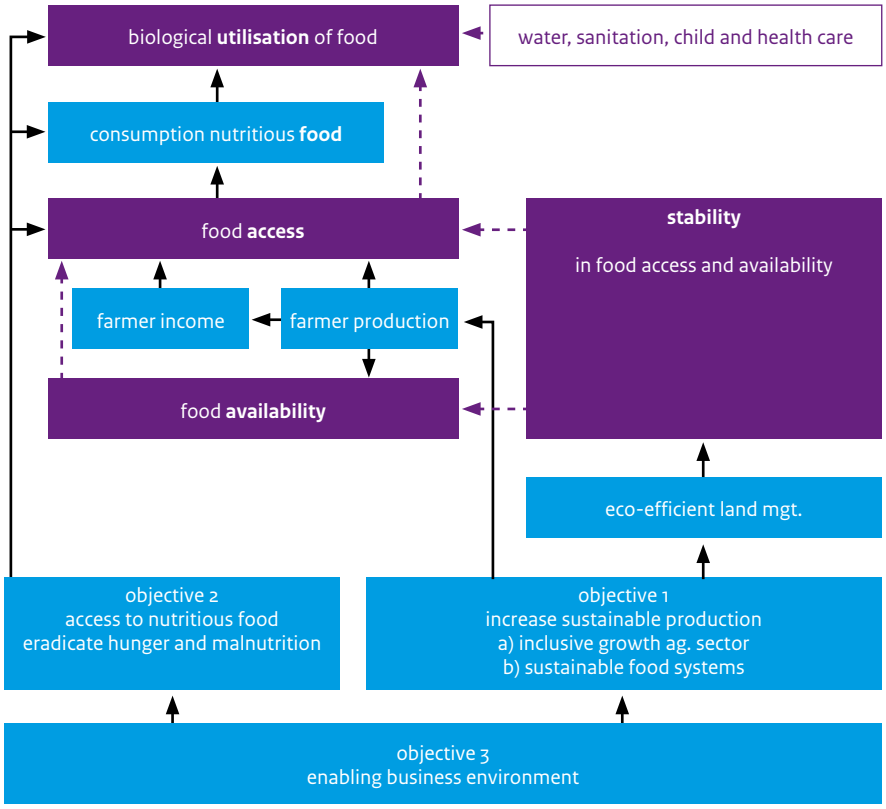
Objective 1: Increased food production and farm income positively affect household food access and local food availability, and improved sustainability of food systems positively affects stability in food access and availability.

Objective 2: Improved access to nutritious food leads to improved consumption of nutritious food and to improved food utilisation.

Objective 3: An improved enabling business environment mainly facilitates the work that falls under policy objectives 1 and 2.

This framework is helpful for tracing the contribution of the policy objectives and the impact pathways of Dutch-funded programmes to food security.

Figure 7.1 *Dutch food security objectives (blue) and their contribution to the four food security aspects (purple)*



The contribution of projects to reduced hunger and malnutrition also depends on their *inclusiveness*: to what extent do food-insecure people benefit? Benefits can be direct (e.g. when food-insecure farmers can benefit from new technologies or markets) or indirect (e.g. when poor consumers benefit from increased availability of food at affordable prices, or from an increased demand for labour).

Five criteria are used in this section to assess the contribution of the 11 pathways to the reduction of malnutrition and hunger: inclusiveness, availability, access, utilisation, and stability. The section builds on the results in the previous chapters, plus results from evaluations and literature. Each subsection ends with an overall assessment.

We acknowledge that in the period under review many Dutch-funded food security activities did not have the explicit objective of reducing hunger and malnutrition. Nevertheless, we find it appropriate to assess the contribution of the whole portfolio towards this global food security challenge, because: (i) even if they do not have an explicit food security objective, projects may have a positive or negative impact on hunger and malnutrition that

should be known; (ii), the policy implicitly suggests a link between general agricultural development and reducing hunger and malnutrition; and (iii) the results of this assessment can be used to inform a future food security policy, to optimise its contribution to the target of eliminating hunger by 2030.

Increased farm production and income and sustainability

Agricultural research (pathway 1)
Impact evaluations and meta-evaluations of agricultural research that started decades ago have convincingly shown that applying the research findings has had an effect on food availability, access, and utilisation: a reduced prevalence of malnutrition. An important part of the impact on food security was achieved through indirect effects: increased food availability lowered the food price relative to wages for consumers, and at the same time the intensified agriculture supplying the food increased the demand for labour (Evenson and Gollin, 2003; Hazell, 2009; Larochelle et al., 2015; Zeddies et al., 2001). Most impact studies and meta-analyses that have found an impact on food security have traced it back to the effect of genetic improvement of crops and efforts to reduce diseases in crops and livestock (e.g. Larochelle et al., 2015; Zeng et al., 2015). The eight CGIAR research programmes supported by the Netherlands cover topics relevant for current challenges in food security, with less emphasis on traditional staple crops but more emphasis on nutrition and health, policies, and environmental management in vulnerable areas.

Public farmer training and information services (pathway 2)
The mid-term reviews of Dutch co-funded farmer extension projects did not find effects on food security, but the systematic reviews found an effect on production and income, and thus on food availability and access. The interventions have usually reached the more innovative, slightly better-off farmers – many of whom are also food insecure – and do not always succeed in reaching the poorest farmers and women. The intensive 'farmer field school approach' has had clear effects on the directly trained lead farmers, but the spill-over effects on their neighbours (who might be food insecure) are often non-significant. Evidence from the broader literature of farmer training on food utilisation is scarce. There are, however, some examples in which farmer training combined with the introduction of a specific nutritious crop has been found to have a positive effect on food utilisation (Stewart et al., 2015; Waddington et al., 2014).

Value chain development (pathway 3)
The IOB impact study of the value chain development project in Bangladesh, SAFAL, showed that it had led to increased production of high-value food products and farm income (availability and access). SAFAL made an explicit effort to include people with little or no land, focused on nutritious food (also for the domestic market), and included a nutritional awareness component. This has reduced the hunger period (food stability) and increased the diet diversity (food utilisation) of project beneficiaries, including the poorer or landless households.

The direct effects on food access of farmers participating in value chain development projects depend on whether food-insecure farmers can also participate and whether the income effects are sufficiently large to improve food access. The literature shows that the farmers participating in and benefiting from value chains are usually the better-off farmers, who are well organised and well-integrated in the market (Vorley et al., 2012). Poorer and more food-insecure farmers often do not participate, or if they do, do not benefit as much. There is certainly scope for enlarging the inclusiveness of value chain development for poorer farmers by carefully choosing the product, the market and the required technology, capital and assets. Certification schemes that require investments and recurrent costs are particularly likely not to be inclusive for the most resource-poor farmers.

The effects of value chain development on food utilisation are unclear as yet, but likely depend on the type of product, type of producer, and type of market, and on whether men or women are involved (see section 7.2.2.). Depending on the design of the value chain, the effects on dietary intake and nutritional status may be either positive or negative. While men are typically involved in formal markets for cash crops, women are more involved in food crops sold in informal and nearby markets. In addition, women's income contributes more to household food security than the men's income (Bake, 2017). Value chain development projects might involve a specialisation in food crops (e.g. vegetables and fruit) for commercial purposes, shifting control over the crop's production and revenue from the women to the men in the household. This might have a negative effect on the adequacy of the household diet (e.g. Chege et al., 2015).

Value chain development can also have important structural, indirect effects[95] on food-insecure people by creating employment and by improving the availability of affordable, nutritious food. The employment created in farms supplying value chains often benefits poorer people and women, as for example in the horticulture sector in Ethiopia, where 85% of the labourers are women (IOB country study) and in Senegal, where the horticultural sector increased employment and reduced the poverty rate of the poor (Maertens et al., 2012). Value chain development can result in income diversification or off-farm employment, in which case it contributes to income stability, but it can also result in specialisation, increased risks, and less income stability. Value chain development creates linkages between producers and consumers, including those in urban areas, and impacts food availability and prices. Job creation and food availability for consumers are, however, hardly ever explicit objectives of value chain development projects and therefore are generally neither monitored nor evaluated.

Natural resource management in agriculture (pathway 4)

Evaluations of water management for agriculture projects show clear effects on food security. Production increases, such as those found in Rwanda and Bangladesh, have indeed resulted in increased food access and availability. Irrigated agriculture is less vulnerable to droughts than rain-fed agriculture. Furthermore, irrigation allows farmers to grow more

[95] These food availability and employment effects are called structural and indirect because they go beyond the direct effects experienced by farmers participating in agricultural development projects and have a more structural effect on the wider economic and food environment.

than one crop per year. Both effects improve stability in food availability and access. A potential downside of some irrigation projects, for example the PISP project in Indonesia, is specialisation on rice, reducing production diversity and diet diversity. In other cases, irrigation has triggered vegetable production in the dry season, contributing to diet diversity. Projects working on natural resource management and on climate resilience have the potential to stabilise food availability and access, but these effects have not yet been evaluated.

In can be concluded that all pathways under the policy objective 'increased sustainable production' contribute to food availability and access, but are not always inclusive, nor do they always contribute to food access stability or food utilisation (see Table 7.1). This means that the implicit assumption that stimulating agricultural development helps reduce hunger and malnutrition is not universally valid. In one sense, many activities were not *nutrition-sensitive:* they were not expressly designed to help reduce hunger and malnutrition. In Section 7.2.2, we further elaborate on the relationship between agricultural development and reduced hunger and malnutrition to show why this relationship is less straightforward than assumed. This will make it easier in future to make policy relating to agricultural development more nutrition-sensitive.

Table 7.1 Assessment of the contribution of 'increased sustainable production' to food security

	Inclusiveness	Availability	Access	Stability	Utilisation
1. Agricultural research	++	++	++	+	+
2. Farmer extension	+/-	++	++		+/-
3. Value chain development	+/-	++	+	+/-	+/-
4. NRM for agriculture		+	+	+	

NRM = natural resource management.
++ Proven effect; + Indirect or weak evidence; +/- Ambiguous effect: proven positive in some contexts, negative in other contexts. Empty cells indicate insufficient evidence is available.

Improved access to nutritious food

The pathways 'social safety nets' (pathway 5), 'fortification' (pathway 6) and 'nutritional awareness and behaviour' (pathway 7) contribute to the policy objective of increased access to nutritious food and have been discussed up to nutrition level in Chapter 4. In general, all projects following these three pathways are inclusive to food-insecure people and contribute to improved food utilisation (Table 7.2). However, targeting in some social safety net programmes has been hindered by inadequate household data or corruption. Pathways 5 and 6 also contribute to food access and its stability. Social safety nets may increase local availability if additional food is imported. Nutrition awareness and behaviour projects require sufficient food access if they are to help reduce hunger and malnutrition and correct perceptions on health (stunting and overweight) (Van Meijl, 2017). The interventions supported by the Netherlands that follow this pathway often take this into account and include a vegetable gardening component or complement value chain development projects that may increase food access.

Table 7.2 Assessment of the contribution of 'improved sustainable production' to food security					
	Inclusiveness	Availability	Access	Stability	Utilisation
5. Social safety nets	+	+/0	++	++	++
6. Fortification, supplements	++	++	++	+	++
7. Nutrition awareness, behaviour	++	+/0	+/0	+/0	++

++ Proven effect; + Indirect or weak evidence; +/o Ambiguous effect: proven positive in some contexts, no effect in other contexts.

Enabling business environment

Land tenure security (pathway 8)
The evaluation of the land tenure regularisation programme in Rwanda did not reveal any effects on agricultural production. A systematic review showed that in Asia and Latin America, activities improving land tenure security had large effects on agricultural production and income and thus will have had positive effects on food availability and access. In contrast, in Africa, the effects on food access or availability were unconvincing, most likely because of existing well-functioning traditional land tenure systems (Lawry et al., 2014). The review did not find evidence of improved food consumption or stability in food access.

Infrastructure: feeder roads (pathway 9)
Both the evaluation and broader literature show that rural roads had positive effects on markets, prices (access), agricultural production (availability and access), and off-farm employment (access and stability) (Hine et al., 2015). One study showed that households closer to a road are more food secure and have diversified their diet (Stifel and Minten, 2017)

Capacity development of farmer organisations (pathway 10)
Most evaluations show that for the more commercially-oriented producer organisations, capacity building efforts are effective in increasing the sales and income of member farmers, which improves food availability (if food is sold) and food access. The effects on food security will be limited because member farmers are relatively better off, while poorer farmers are rarely members of these commercial farmer organisations. We found no evidence for improved food stability or utilisation.

It can be concluded that although the enabling business environment pathways are there mainly to facilitate other efforts, they themselves also positively affect food security (see Table 7.3.). They are often inclusive for poorer farmers (land tenure), consumers, and off-farm labourers (roads); they improve availability and access; roads even contribute to stability in access and food utilisation by improving access to food produced elsewhere. Farmer organisations do improve availability and access but are often less inclusive.

Table 7.3 Assessment of the contribution of 'improved enabling business environment' * to food security					
	Inclusiveness	Availability	Access	Stability	Utilisation
8. Land tenure	++	++/0	++/0		
9. Infrastructure (rural roads)	++	++	++	+	+
10. Farmer organisations	+/-	++	++		

++ Proven effect; + Indirect or weak evidence; +/o Ambiguous effect: proven positive in some contexts, no effect in other contexts; +/- Ambiguous effect: proven positive in some contexts, negative in other contexts. Empty cells indicate insufficient evidence is available.
** Pathway 11: Results from multi-stakeholder policy dialogue were too remote from these criteria and were therefore not assessed for their contribution to food security.*

7.2.2 From agricultural development to food utilisation

One of the implicit but important assumptions of Dutch food security policy is that agricultural development, which generally results in increasing farm production and income, will eventually also contribute to reduced hunger and malnutrition. However, the relationships between agricultural production and income, and food consumption, are not straightforward.

In the previous section, the contribution of each of the 11 pathways to reduced hunger and malnutrition was assessed. Relevant literature was presented under each pathway. However, throughout this assessment, we came across literature about more general mechanisms that explain how agricultural development leads to improved nutrition. These mechanisms, which cut across the 11 pathways, are synthesised in this section:

- Inclusiveness of agricultural development.
- Effect of commercialisation on food utilisation.
- Effect of intra-household dynamics and gender on food utilisation.
- Indirect effects on consumers: food availability and income.

Inevitably, there is some repetition of previous sections. Finally, a short explanation is given on how the quality of food consumption was monitored in the IOB impact studies. This 'nutrient adequacy' is a relevant indicator for designing nutrition-sensitive interventions.

Inclusiveness of agricultural development

How inclusive agricultural development is, is unclear. To investigate this, it is useful to distinguish different farm types, or different 'rural worlds' (Vorley et al., 2012):

- A very small percentage, 1-2%, of commercial farmers, organised in farmer organisations and vertically integrated in formal markets.
- A large percentage of farmers, unorganised, that occasionally (20-30%) or regularly (3-15%) sell on informal markets.
- A large percentage, 40-50%, of subsistence farmers that have very little land, depend on off-farm income and are net food consumers.

Many results from agricultural research, such as the high-yielding varieties underpinning the green revolution in Asia, have been adopted by a large proportion of farmers and thus can be considered to be fairly inclusive. On the other hand, evidence shows that value chain development and capacity development of farmer organisations are not always inclusive of the poorest farmers. In general, these interventions succeed in reaching many small-scale and medium-sized semi-commercial farmers, the relatively better-off in the total farmer population. However, they often exclude the most resource-poor and less organised farmers, who are likely to be also the most food insecure. Moreover, if included, the smallest farmers benefit the least from participation. This is due to benefits (e.g. price premiums) that are positively related to land size (limiting the potential for small farmers), a lack of resources for applying the required technology, and the high fixed costs and investments required for participation (e.g. spending additional time on training or production activities, or necessary investments in technology). These interventions therefore do not offer the poorest rural households a direct opportunity for improving their livelihoods. The level of inclusiveness is a gradual scale and there is certainly scope for making value chain development more inclusive by a considerate choice of the product and market that determine the required inputs, technology, capital, and assets. Indirectly, poorer households may also benefit if local availability of food increases, or if low-skilled jobs are created through agricultural development (see indirect, structural effects).

Effect of commercialisation on food utilisation

Agricultural interventions affect farm decisions such as how much to produce of what crop, how much of the farm's produce to consume, and how much to sell. If a crop becomes more profitable as a result of the intervention, it might increase total household income, the share of land being devoted to that crop, and how much harvest is sold (as opposed to consumed). For example, participation in a certification scheme that raises farm gate prices for a product like coffee encourages specialisation for the market.[96] Agricultural development interventions thus affect the level of commercialisation and the balance between specialisation and diversification, either directly by assisting farmers or indirectly by improving the enabling business environment and markets.

The effect of commercialisation on food consumption is controversial. The IOB household survey data from 2014 and 2016 from the Dutch-funded projects in Bangladesh, Ethiopia, and Rwanda were used to validate the assumed relationships between agricultural production, commercialisation, and food consumption at farm household level (see Kuijpers and Schenk, forthcoming[97]). The estimation results suggest that the effect of agricultural commercialisation depends on the country and on the dimension of dietary quality. They find positive effects of agricultural commercialisation on dietary diversity in Ethiopia and on nutritional adequacy in Rwanda, but a negative effect on dietary diversity in Bangladesh. In all countries, commercialisation led to an increase in the value produced, but this did not translate into higher food expenditures except in Ethiopia. If anything, food

[96] At the same time, food preferences and risk avoidance may motivate farmers to maintain a diversified farm, producing both for the market and for their own consumption.

[97] Kuijpers, R. and J. Schenk. Forthcoming. The effect of agricultural commercialisation on diets of farm households: Evidence from Ethiopia, Bangladesh, and Rwanda.

expenditures decreased as a result of commercialisation in Bangladesh. In Rwanda, commercialisation positively affected nutritional adequacy instead by mainly having a positive effect on the number of food groups produced by the farm. In this case, commercialisation led to crop diversification.

The lack of consensus in the broader literature about the relationship between commercialisation and nutritional outcomes suggests that the assumption that agricultural commercialisation automatically improves a farmer's nutritional outcomes is invalid.[98] The importance of production diversity for consumption diversity and quality is confirmed by the broader literature (e.g. see Carletto et al., 2015). However, for some people, especially those in rural areas, food markets are far away or are unreliable in terms of the availability and price of food products. Then, what they themselves produce is an important determinant of what they consume (e.g. Hirvonen and Hoddinott, 2017).

The effect of intra-household dynamics and gender on food utilisation

A better understanding of the intra-household dynamics and role of women can explain whether nutritional outcomes are achieved and, if so, how, and how agricultural interventions can be better designed to achieve desired nutritional outcomes. A literature review by Bake (2017) has analysed the intra-household dynamics of nutritional outcomes, with a focus on gender differences[99]. The author used a concept that follows agricultural production, marketing, and food consumption – with a slight extension to childcare and the influence of access and control, decision-making, division of labour and social/cultural norms. The study found large differences between men and women in production, markets, and consumption:

Production:

- Women have less access to land, extension services, new technologies and inputs, and credit, partly due to lower mobility and discriminatory traditions and laws.
- Certain crops and types of livestock are considered the domain of men, whereas others are considered the domain of women. Higher status and higher value products, especially cash crops, are more often the domain of men.

Markets:

- Women's access to markets increases diet diversity. In the case of poor market access, the household mainly depends on its own production to access nutritious food (vegetables, fruit, animal products).
- If the product is sold by men, women do not control this income, even when they are involved in production.

[98] A recent study that is representative for farmers in Malawi, Tanzania, and Uganda also found there is no evidence that agricultural commercialisation has led to improved nutritional intake in these countries (Carletto et al., 2017). Much of the older evidence that found positive effects of commercialisation on nutritional intake is based on cross-sectional data. This new study and our meta-analysis use panel data which can be considered to be methodologically superior.

[99] Bake's results will be used in a forthcoming KIT policy paper: 'Women's empowerment from agricultural towards nutrition: key insights from impact evaluations'.

- Traditional, low-value products, produced in smaller quantities for nearby informal markets are sold by women; high-value products produced in larger quantities for more remote or more formal markets are sold by men.
- The trend is for both men and women to become more involved in producing for the market. However, a product that becomes more commercially interesting may shift from women's control to men's control.
- Women's mobility is limited, for practical reasons and because of cultural norms. Therefore, nearby markets are more beneficial for women than remote or formalised markets.
- Women's mobility and involvement in community or women's group activities increase their confidence, bargaining power, and influence on intra-household decisions.

Consumption:

- Women's income is spent more on food, healthcare, and child care, while men's income is invested more in assets and education. An increase in women's income has a positive effect on food consumption and diet diversity.
- Status and cultural norms result in unequal food distribution ('food favouritism') within the household. Often the male household head receives the best food, while the woman receives the least.
- Certain traditions, beliefs, and taboos give 'wrong' food recommendations for young pregnant and lactating women, depriving them of sufficient nutritious food.
- There is a trade-off between women's time spent on agricultural production and time spent on food preparation and child care.

Agricultural development affects how the family income is spent by affecting what product is produced (and by whom) and which crop is used for commercial purposes. The income earned by the female affects her level of empowerment and is an important determinant of what a household consumes.[100] Recent research from Senegal, for example, shows that female wage employment in the horticultural export sector increases food access, shortens the hunger season, and results in better- quality food being consumed (Van den Broeck et al., 2017). Although men receive a higher salary, the research did not find any effect of male wage employment on food access, the hunger season, or food quality.

If the effects of agricultural development on women empowerment and intra-household decision-making processes are ignored when designing agricultural development projects, the effects (both negative and positive) on nutritional intake and nutritional status are very uncertain.

[100] There are two possible scenarios: the woman's share of total household income increases, giving her more bargaining power if she has to secure her husband's permission on how she spends money, or women are free to decide by themselves how to spend the income they earn.

Indirect, structural effects on consumers: food availability and income

Beyond the direct effects on farmers participating in agricultural projects, agricultural development also has indirect, structural effects on the wider economy and food environment by reducing food prices and by increasing the demand for labour.

Reduced food prices and smaller price fluctuations have a positive effect on rural and urban food-insecure consumers, including many poor subsistence farmers who depend on off-farm income and are net food buyers. Agricultural development, market integration, and value chain development can result in lower input prices and higher output prices for producers, which improves production efficiency, encourages production, and increases food availability. The nutritional effect of the increased food availability depends on the nutritional value and affordability of food. The food purchasing power of consumers is improved by more off-farm income opportunities that may arise from agricultural intensification and development in value chains, and from trade and processing. As mentioned earlier, consumer choices will depend not only on availability and prices, but also on food preferences, habits, and awareness of nutrition and health benefits.

While low food prices are good for consumers, there has been discussion about whether they are good or bad for producers: low prices may discourage farmers who are net producers, but high prices are bad for the poorest farmers, who are net food consumers. It is generally agreed that large food price *fluctuations* are bad, typically with low prices just after harvest and high prices before harvest when reserves run out. Efforts to reduce food price fluctuations through market integration, farm diversification, agro-processing, and conservation and stockpiling food benefit both producers and consumers.

An oft-overlooked issue in the welfare analyses of agricultural development interventions is that poor households may benefit through employment effects. These effects might be more important for food security than the effect of the intervention on farmers. In some sectors wage labourers far outnumber the farmers involved in the intervention. Jones et al. (2010), for example, report that approximately 7,000 smallholders were involved in fresh vegetable export in Kenya, while 40,000 to 60,000 persons were involved as labourers in the processing industry or as farm workers. Another interesting example is the horticulture sector in Ethiopia, which, according to the Ethiopian Horticulture Producer Exporters Association (EPHEA), employed 180,000 people in 2016.

Resource-poor (and food-insecure) households are particularly likely to benefit from jobs created by agricultural interventions. The development of the horticultural sector in Senegal, for example, increased employment opportunities for the poor (Maertens et al., 2012; Maertens and Swinnen, 2009). In the long term this has had a large positive effect on household incomes and has reduced poverty (Van den Broeck et al., 2017). Moreover, the employment opportunities were particularly inclusive to women (Maertens and Swinnen, 2012). According to EPHEA, 85% of the labour force in the flower sector of Ethiopia is female. As discussed in previous paragraphs, these labour opportunities can improve women's empowerment, which positively affects food security outcomes.

The employment effects strongly depend on the labour intensity of production and processing, which in Bangladesh, for example, is higher for horticulture than for shrimp production. Moreover, the welfare and food security effects depend on the labour conditions. Sustainability standards, as promoted by IDH, often include aspects relating to labour conditions: for example, on safe use of pesticides by smallholder farmers, or maximum working hours on large estates. Labour standards and codes of conduct, in particular, can improve worker's wellbeing (Barrientos et al., 2003). Even food quality and safety standards such as GlobalGAP may generate benefits for workers by increasing the need for companies to invest in training. In those cases, companies might pay an efficiency premium to trained workers in order to keep them in the company. Colen et al. (2012), for example, present evidence that certification to private standards in the horticulture sector in Senegal led to increased employment periods and higher wages for workers.

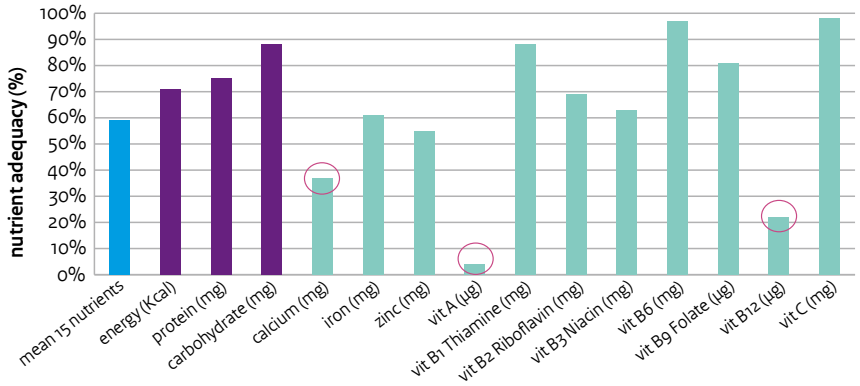
Monitoring nutrient adequacy as tool for nutrient-sensitive interventions

For nutrient-sensitive agricultural interventions, one should be able to monitor the nutrient value of food consumption. This is often assessed using the household diet diversity score, counting the number of different food groups eaten the last 24 hours, to provide a proxy indicator for nutrition value. A more advanced indicator of diet quality is nutrient adequacy, which was used in the IOB impact studies and entails converting household food consumption (expressed in kg per food item consumed over the last seven days) into household nutrient intake using a food composition table (Bake, 2015). This intake is then compared to the recommended nutrient intake for individuals of different age and sex. Actual intake divided by recommended intake then gives us the percentage nutrient adequacy for each nutrient and gives a good indication of for which nutrients the intake is most deficient.[101] By way of example: The IOB impact study, complemented by a nutrition analysis that provided nutrient adequacy data in the cassava-growing area in southern Rwanda (AIID-PwC, 2017a; Bake, 2015) showed that the diet was relatively adequate in energy, carbohydrates, and protein, but largely inadequate for vitamin A, vitamin B12, and calcium (Figure 7.2). Calculations of nutrient adequacy in the project area of Bangladesh (Aidenvironment-APE-BRAC-IHE, 2017), and Ethiopia (Ecorys-WUR-NMA, 2017) showed a similar pattern, with major deficiencies in vitamins A, B12, and in calcium, while the intake of energy, carbohydrates and protein was relatively adequate.[102]

[101] Note that because of the way the nutrient adequacy indicator presented has been calculated, it does not exceed 100% and therefore does not capture the problem of overnutrition.

[102] When interpreting these figures the context needs to be taken into account. For example, in Bangladesh, soils and groundwater are iron-rich, so the low iron intake from food may not be a constraint. Another example: edible oil in Bangladesh is fortified with vitamin A. This was overlooked in the food consumption survey and food composition table, so vitamin A intake was underestimated. More in general, the food consumption survey, based on a seven-day recall, underestimates the consumption of smaller quantities of food and food eaten out of home.

Figure 7.2 *Nutrient adequacy of food consumption by cassava farmers in southern Rwanda in 2014*



Source: Bake, 2015.

Knowing the nutrient adequacy of household diets enables agricultural interventions to be made more nutrient-sensitive. In the case of Rwanda, for example, the project encouraged the production of cassava as source of income, yet people were consuming insufficient vitamin A. This deficiency could have been addressed by promoting crops rich in vitamin A instead of cassava, such as orange-fleshed sweet potato, which would easily have fitted into the local farming practices and food habits.

7.3 Contribution to sustainable food systems

The *sustainability* objective in Dutch food security policy (2011) refers to environmentally sound agricultural practices, including resource efficiency (land, water, inputs), climate-smart agriculture (anticipating more frequent droughts and floods) and land use planning for agriculture and other natural resources. In 2014, the Ministries of Foreign Affairs and Economic Affairs introduced the concept of *sustainable food systems*. This concept refers to land area under eco-efficient management, but also acknowledges that consumption affects the pressure on natural resources in developing countries.

In its Global Food Policy Report 2016, IFPRI discerns six requirements to ensure long-term food security (Fan, 2016):

1. Production efficiency and reduced losses
2. Inclusive agricultural transformation
3. Climate change adaptation
4. Environmental sustainability
5. Food systems driven by nutrition and health
6. Business-friendly systems

We have combined these requirements with the food system framework: production – trade and processing – consumption (Table 7.1) and have populated this table with the main challenges. This overview helps to understand the contribution of Dutch policies to sustainable food systems. Below, we discuss each of these six requirements in more detail: what needs to be done and the contribution of the Dutch food security policy to these challenges.

Table 7.4 The main challenges when aiming for a sustainable food system

	Agricultural production	Trade and processing	Consumption
1. Efficiency	Higher production using less land, water, inputs.	Infrastructure, VCD, markets, policies, reduce waste.	Consumer awareness to reduce waste.
2. Inclusiveness	Smallholder farmers, women; anticipating agricultural transformation and rural transition.	Market access (by smallholder farmers and by the BoP consumers).	Affordable food, BoP.
3. Climate-smart	Adapting agricultural production and practices, policies.	Energy-efficiency throughout the chain.	Labelling footprint.
4. Sustainability	Reducing land degradation, water overexploitation, pollution.	Value chain sustainability standards.	Labelling footprint. Reduce the demand: avoid over-nutrition, reduce consumption of animal products, family planning (SRHR).
5. Nutrition and health driven	Policy and market incentives to encourage production to meet nutrition demand.	Nutritious value chains, BoP, food safety, fortification, labelling, regulation.	Nutritional awareness and information, women's empowerment.
6. Business-friendly	Research, extension; PPP invest in innovations.	Well-functioning markets, infrastructure, energy, storage.	Pay for market-based solutions, reduce price fluctuations.

VCD = value chain development; PPP = Public-private partnerships; BoP = bottom of the pyramid, i.e. serving poorer consumers; SRHR = sexual and reproductive health rights.

1) Production efficiency and reduced losses

To feed the world in the long run, more food needs to be produced on a shrinking area of agricultural land, with limited water resources and shrinking stocks of non-renewable inputs (e.g. phosphorus, fossil fuels). This calls for an increase in production and in production efficiency, and for recycling non-renewable inputs (e.g. converting organic household waste into fertiliser). An important part of the efficiency losses happens along the value chain, resulting in about 30% of food production not being consumed due to food losses in agricultural production and transport, especially in developing countries, and food

waste in retail and within households, especially in developed countries (FAO, 2011). Value chain development projects could address this by working on pre- and post-harvest practices, storage (including cold storage), processing and efficient logistics, and by stimulating behavioural change by consumers.

In the Dutch food security portfolio, agricultural research and extension in particular pay attention to increasing production and production efficiency. For example, IFDC calculates the production per unit input and the costs per unit product, and addresses integrated soil fertility management. However, across the portfolio, the production efficiency of promoted practices is rarely monitored and evaluated. Reducing food waste is a relatively new topic, discussed in 2015 at an international conference co-organised by the Netherlands and FAO in the Netherlands.[103]

2) Inclusive agricultural transformation

To assure food access for all, agricultural transformation needs to be inclusive for smallholder farmers. The 570 million smallholder farmers in developing countries include about 50% of the world's hungry (Fan, 2016), so by working with smallholder farmers we work on food availability and access at the same time. However, anticipating agricultural transformation and rural transition, it is useful to distinguish three groups of current smallholder farmers, as proposed by Dorward et al. (2009) and used by DFID in their conceptual framework on agricultural (DFID, 2015):

- the first group will become more productive and market oriented: 'stepping up';
- the second group will leave their farm and find other employment: 'stepping out'; and
- the third group has no potential for stepping up or for stepping out, e.g. because they are on marginal farms in remote areas with no other employment opportunities: 'hanging in'.

Trade and value chain development have a role to play in linking smallholder farmers to markets and in serving relatively poor consumers – the 'bottom of the pyramid' – by making affordable and nutritious food available. For poor consumers, affordability of nutritious food is key. Improved food availability, higher incomes, market integration, and reduced food price fluctuations can contribute to this.

The Dutch food security portfolio targets smallholder farmers and as such includes food-insecure households and women. However, projects working on value chains mainly reach the slightly better- off farmers, in slightly more accessible areas, i.e. farmers that in Dorward's concept of the 'three rural worlds' would be qualified as 'stepping up'. Whereas the World Development Report 2008 (World Bank, 2007) distinguished two groups – (i) farmers with commercial potential, and (ii) subsistence farmers – each requiring a different type of agricultural support, Dutch food security policy mainly focuses on the first group. Dutch private sector development policy (with a separate budget) supports the creation of employment that would help farmers to step out, although the number of jobs created so

[103] As a follow-up, there is a post-harvest network that focuses specifically on reducing food losses. This resulted from a motion to engage NGOs in reduction of food losses, which was adopted in the Dutch House of Representatives in 2016.

far is still very modest (IOB, 2014b), especially compared to the number of farmers. While social safety nets (e.g. the Productive Social Safety Net Programme in Ethiopia) target food-insecure subsistence farmers that are currently hanging in, the Netherlands pays less attention to helping these farmers improve their medium- to long-term livelihoods. In general, it assumed that as a result of agricultural development, in the long run employment opportunities will become available for this group too.

An exception is the Dutch support to vocational training. These programmes actively assist the 'stepping out' group either in becoming self-employed or in preparing them for the job market by enhancing their skills. Whether these Dutch-funded programmes have been effective is beyond the scope of this policy review.[104] However, a recent study of employment and skill training programmes in developing countries concluded that, in general, these programmes have shown little impact on poverty, especially given the relatively high programme costs per trainee (Blattman and Ralston, 2015). The authors also found that one-off asset transfers (in the form of cash, capital goods, or livestock) – which were often complemented with a simpler, lower-cost training programme – are a more cost-effective alternative to stimulate self-employment and raise long-term income potential.

3) Climate change adaptation

Climate change will result in more irregular rainfall, with more frequent droughts in some areas and more frequent floods in others. To assure the resilience of the entire food system, agriculture needs to become more climate-resilient. This can be done by investing in physical infrastructure (dikes, irrigation, roads), adapting agronomic practices (improving soil water holding capacity, planting drought-resistant varieties) and by farm and income diversification. Climate change can be mitigated by higher energy efficiency per unit food product, which can be improved throughout the food chain from production to consumption. Consumers can be made aware of the climate or environmental footprint.

One of the larger climate change adaptation programmes that the Netherlands supports is the IFAD grant programme (ASAP), which explicitly addresses climate adaptation as an add-on component to their regular loan project portfolio. This has brought at least the intentions and design of climate change adaptation into agricultural development programmes, but it is too early to evaluate its effectiveness. The Netherlands was also involved in the initiation of the global discussion forum Alliance for Climate-Smart Agriculture. Other than that, climate change adaptation has not yet received much emphasis on the ground in agricultural development interventions supported by the Netherlands; most Good Agricultural Practices are also considered to be adapted to climate change.

4) Environmental sustainability

Poor agricultural and irrigation practices can result in land degradation, overexploitation of water, and pollution of the environment, undermining the resource base for future food production. Demand for biofuel and feed for livestock increases the pressure on natural resources. Labelling can encourage consumers to opt for products with a smaller climate or

[104] Note that vocational training is also financed from the food security budget but is not part of this policy review due to the small size of the expenditures and because of the topic's distinctive nature and complexity.

environmental footprint. The food system also becomes more sustainable by reducing demand for food. This can be achieved by reducing overnutrition (and overweight) and consuming fewer animal products. Education, family planning, and sexual and reproductive health and rights lead to fewer children and therefore a lower future food demand.

Voluntary sustainability standards are a market-based option to encourage producers to make agricultural practices more sustainable and to encourage consumers, retailers, and industry to pay for this. Consumers could also be encouraged to change their diet to reduce their environmental footprint.

In the Dutch food security portfolio, environmental sustainability receives attention to varying degrees in the recommendations for agricultural practices, often as part of interventions to increase productivity. Many of the projects working on irrigation – mostly funded from the 'water' budget – are playing a major role in assuring future agricultural productivity. Environmental sustainability is also addressed in sustainable value chains, such as those supported by IDH and Solidaridad, which has a major advantage of linking production, trade, and consumption, and involving the private sector. Evaluations show that these projects have been successful in creating a consumer and industry demand for environmentally sustainable products and in reaching many producers by involving the private sector, but that environmental impact has been very modest, if measured at all, due to low environmental sustainability standards (see Chapter 4.4). Only a few activities go beyond the level of the farmer's field and address environmental sustainability at landscape level. Environmental issues first need to be prioritised in a country context analysis that can assist further planning in multi-annual strategic plans. The link between food security and sexual and reproductive health and rights, which could also result in reducing population growth, is just starting to get more emphasis, e.g. in the Dutch programme in Bangladesh.

On the consumer side in developed countries, little effort is made to reduce the consumption of animal products and the corresponding import into Europe of plant protein for animal feed, yet this would also reduce pressure on natural resources and land degradation in developing countries and reduce manure surplus and pollution in the EU. Through the so-called 'Green Deals', initiatives are supported for plant-based protein as alternative for animal products in the Netherlands. At the global discussion level, the Netherlands has contributed to the FAO-hosted initiative 'Global Oceans Action Network for Food Security and Blue Growth'.

5) Nutrition and health-driven food systems

Given current trends in diets, malnutrition, and obesity, there is less need for staple crops (energy) and greater need for vegetables (micronutrients) and pulses (protein and micronutrients). In developed countries, the consumption of animal products should be reduced, while in developing countries it could be increased. Plant-based protein can substitute some of the animal-based protein. 'Nutrition-sensitive' value chain development could improve the linkages between producers of nutritious food and relatively poor, 'bottom of the pyramid' consumers in developing countries. This requires a demand at the bottom of the pyramid for nutritious food, which, in turn, requires sufficient nutritional

awareness and knowledge on the part of consumers, and a food environment with a healthy food supply.

Many activities in Dutch food security policy put the emphasis on smallholder farmers and on improving their production and marketing in order to increase their income. The policy puts less emphasis on the consumer and on matching sustainable production with healthy consumption. This is not unique to Dutch policy: agricultural policies in many other countries and EU policy have paid little attention to 'nutrition-sensitive agriculture' so far (Wetenschappelijke Raad voor het Regeringsbeleid, 2014). But there is a paradigm shift: recent discussion and position papers, e.g. by FAO and IFAD, put more emphasis on this. There are some encouraging examples. These include the UNICEF programme that works on vegetable gardens as part of UNICEF's nutritional behaviour programme, the IFDC 2SCALE programme that has several value chains of nutritious products for poor consumers, and the GAFSP-supported baby food factory in Rwanda. But the majority of activities that work on farmer production and income hardly consider the nutritional effects on either the farmer or the consumer.

6) Business-friendly

Without the involvement of the private sector – farmers, traders, transporters, industry, and retailers – the food system will not become sustainable. For a food system to be sustainable, it must be profitable. On the production side, the private sector can be stimulated by public investment in the enabling business environment: giving public support to agricultural research, extension, and farmer organisations, and supporting public-private partnerships that bring knowledge and innovations to developing countries. On the trade and processing side, public support to infrastructure, roads, energy, and education will encourage private sector investments. Government regulations and legislation that reduce trade barriers and other market distortions contribute to a well-functioning market, which in turn reduces prices and price fluctuations for consumers. Private sector initiatives will also have to be properly guided by adequate legislation on labour rights, protection of the environment, food safety, and animal welfare. International agreements and harmonisation of procedures which take into account the special position and needs of developing countries will make such regulations more effective, open up international markets and provide a level playing field for the private sector.

As such, a business-friendly approach is at the core of the Dutch food security policy, acknowledging the importance of the private sector, working for an improved business environment and advocating public-private partnerships or, even better, the 'Dutch diamond approach' in which government, private sector, agricultural research and civil society work together on food security solutions.

7.4 Synthesis

Based on the previous two sections, the following conclusions can be drawn about the contribution of Dutch policy on food security to food security, mainly in relation to the short-term objectives of reducing hunger and malnutrition, and to lesser extent to the long-term objective of sustainable food systems.

The findings in Chapters 4, 5, and 6 and those in the broader literature lead to the conclusion that Dutch food security policy has contributed to a limited extent to the global goal of reducing hunger and malnutrition. Through its food security policy, the Netherlands has clearly contributed to increased food availability, increased food access, and to a lesser extent, food access stability and food utilisation. The effect of agricultural development projects on food utilisation is uncertain, however. The relationship is not as straightforward as is (implicitly) assumed by the policy.

Of the pathways under objective 1 'increased sustainable production', agricultural research, often in combination with farmer training and information services, has convincingly contributed to reduced hunger. In contrast, the contribution of value chain development to food security is less clear: there are some very positive examples, but also examples with no effect. Its contribution depends on a *nutrition-sensitive* choice of target group, product, market, and final consumers. The crop type being promoted (implicitly or otherwise) is a particularly important determinant of the nutritional outcome of an agricultural intervention, as it affects the availability (and price) of nutritious food, the availability of off-farm employment opportunities, and female decision-making power within the farm household.

All pathways under objective 2 'improved access to nutritious food': social safety nets, food fortification, and nutritional awareness and behaviour, have clearly contributed to reduced hunger and malnutrition. Projects following these pathways target food-insecure people, are often *nutrition-specific*, and have contributed to improved food access, stability, and utilisation. Although these projects have had an immediate effect, most projects have not contributed to a long-term solution and self-reliance in food security, so should be followed by more structural solutions.

Of the pathways under objective 3 'enabling business environment', investments in rural roads have clearly contributed to reduced hunger and malnutrition. The other pathways have improved the enabling business environment. To what extent this has contributed to the objective of reduced hunger and malnutrition is unclear.

The indirect, structural effects of agricultural development on the wider economy and food environment, through reducing and stabilising food prices and creating employment for consumers may in the end be more important than the direct effects on the targeted farmers, especially when considering trends in urbanisation and anticipating agricultural transformation. These indirect effects have rarely been built into project design or into monitoring and evaluation.

A combination of interventions in the same geographical area and targeting the same population can create synergy and produce better nutritional outcomes than a single intervention (see Chapter 8). For example, adequate nutritional knowledge and gender equality are important to enable households take informed and balanced decisions about what to produce, consume, and sell in a context of changing incentives, and to create consumer demand for nutritious products. Projects that can promote gender equality and improve nutritional knowledge and awareness are therefore important complements to projects that stimulate agricultural development.

The contribution by the Netherlands to more sustainable food systems, to ensure sufficient food availability in 2050, is difficult to assess. Although the Netherlands has clearly contributed to providing solutions for the six key requirements for the global food system identified by IFPRI, projects and activities often stand on their own and are not part of the coherent and integrated approach that is necessary for tackling such a complex and multi-dimensional challenge. There is much scope for improvement by integrating agricultural, nutritional, and environmental sustainability objectives and by taking an integrated food systems perspective in which the relationships between production, trade, and consumption are explicitly taken into account in programme design and implementation.

Although the Dutch programme does have some good examples of integrated food systems approaches in value chain development, often key challenges are insufficiently addressed for sustainable food systems: the emphasis is often on involving the private sector, improving farmer income, and profitability, but less on environmental sustainability, or nutrition and health outcomes. There are some positive examples in which nutrition of poor consumers (bottom of the pyramid) has been addressed in a value chain approach or where environmental sustainability has been integrated in farmer extension.

Global food security in the future requires not only that sufficient food is available, but also universal access to food. Inclusiveness has recently received more emphasis in Dutch food security policy, but overall Dutch development policy still lacks a long-term vision on agricultural transformation and rural transition. Agricultural transformation will result in farming systems unable to accommodate all current smallholder farmers and their children. Anticipating this agricultural transformation and rural transition, it is useful to distinguish three categories of farmers: those 'stepping up' (becoming commercial farmers); those 'stepping out' (finding off-farm employment) and those 'hanging in' (remaining subsistence farmers without an alternative). Several pathways, especially those working with the private sector, implicitly target commercially-oriented farmers that are 'stepping up', who are often slightly better off. Although social safety nets assist those who are 'hanging in' as subsistence farmers to at least maintain their farming livelihood for the time being, and the Dutch private sector development programme works on creating employment in the agriculture sector, the overall Dutch development policy lacks a vision on how to assist farmers that have to 'step out' of agriculture and work in other economic sectors in the medium to long term.

8

Efficiency and Implementation modalities

8.1 Introduction

The previous chapters discussed the effectiveness of projects grouped into different types of interventions or impact pathways and contributing to the three policy objectives and food security. In addition, to conform to RPE guidelines, the efficiency of the policy must be assessed. However, assessing the efficiency of food security policy is complicated, mainly because an evaluation of efficiency requires: (a) homogenous policies, and (b) reliable information about the costs and benefits of comparable interventions. These conditions are not met in the case of the Dutch food security policy. The preceding chapters showed that the Dutch food security policy has several objectives served by many different interventions grouped into 11 different pathways. The interventions take place in diverging contexts (countries), under totally different circumstances, in an environment where many actors besides the Netherlands are active (e.g. farmers, farmer organisations, governments, bilateral and multilateral donors, NGOs, research institutes). In many cases, it even proved difficult to gather evidence on the effectiveness of interventions.

A second (though more limited) way of assessing efficiency is to analyse the efficiency of the implementation process. This is a cumbersome procedure and, once again, it depends on specific circumstances and requires a benchmark as well. Bearing all limitations in mind, this chapter aims at answering the RPE questions[105] on efficiency through a three-pronged analysis: a comparison of the costs and effectiveness of a small selection of projects, a discussion of the funding mechanisms and implementation channels, and finally an assessment of the operational costs as function of the number of projects to be managed by embassies and the Ministry of Foreign Affairs.

A major conclusion is that the heterogeneity of interventions and the lack of benchmarks preclude a rigorous assessment of the cost-effectiveness of interventions or of the efficiency of the implementation process. Nevertheless, it is clear that the great fragmentation leads to high implementation costs and there is little evidence that small innovative Dutch projects are cost-effective in their own right or are scaled up by larger government programmes or private initiatives.

8.2 Cost-effectiveness

The ideal way of analysing efficiency is to compare the costs and benefits of an intervention with a benchmark, a comparable intervention. As noted in the introduction, this requires the existence of such benchmark, but such a benchmark for Dutch food security policy in development cooperation is difficult to find.

The analysis of evaluations of Dutch food security policies confirms this: existing evaluations hardly ever report about efficiency. To assess the benefits of an intervention it is necessary to know its reach in terms of number of beneficiaries (which is known for at least

[105] Order on Periodic Evaluation and Policy Information (Ministerie van Financiën, 2014).

some of the interventions) and the effect size per beneficiary (which is rarely known). Only three evaluations of Dutch-funded projects provided enough information for us to be able to quantify the benefit, thereby allowing the total project costs to be compared against annual additional benefits, per household (Table 8.1). This overview is complemented by a few studies of comparable projects evaluated by others (IOB, 2011).

Table 8.1 Costs and benefits of Dutch-funded projects and of similar projects from the literature

Pathway	Project, country	NL-funded / Literature	Total project cost per HH (EUR)	Annual benefits per HH (EUR)	Comments	Source
Value chain development	SAFAL, Bangladesh	NL-funded	225	650	Additional income mainly from aquaculture	Aidenvironment-APE-BRAC-IHE (2017)
	Organic coffee Uganda	Literature	60	65	Additional income	Bolwig et al. (2009)
	Dairy equipment Zambia	Literature	2800	260	Additional income	Swanson (2009)
	CATALIST cassava, Rwanda*	NL-funded	40	Nil	Devastating cassava disease outbreak	AIID-PwC (2017a)
Research / extension	Virus-tolerant cassava, Mozambique*	Literature	7	20	Avoided crop loss	McSween (2006)
Water mgt., extension, value chain development	CDSP IV, Bangladesh	NL-funded	630	250	Additional income farming, trading, wages	Aidenvironment-APE-BRAC-IHE (2017)
NRM, Water management	ESIRU, Rwanda	NL-funded	2100	180	Additional crop value	Seebörger (2014)
Water management	Irrigation project India	Literature	1500	180	Additional income	World Bank (2006)

NRM = natural resource management; HH = household.

** Relevant because of the devastating effects of the outbreak of CBSD in the Dutch-funded CATALIST project in Rwanda, and the cost-effective intervention of distributing disease-tolerant cassava cuttings, described in the literature.*

What this overview shows is that project costs and farmer benefits vary enormously, as do cost-benefit ratios. On the cost-benefit ratio, the Dutch-funded value chain project in Bangladesh, SAFAL, scores very well, with annual benefits outweighing the total project costs within one year. This overview also shows that costs of water management, irrigation, and natural resource management, and the capital-intensive investment in milk coolers, are relatively high and take longer to break even with farmer benefits. The Dutch-funded cassava

project in Rwanda suffered from the CBSD outbreak, resulting in no net benefit for farmers; this could have been avoided by a much quicker and large-scale, cost-effective distribution of disease-tolerant cassava cuttings, which were available from agricultural research and extension. The IOB systematic review of different pathways to food security (2011) concluded that reducing production losses by breeding and distributing disease-tolerant crop varieties and biological disease control were very cost-effective ways of improving food security for large groups of farmers, including for poorer subsistence farmers, also in Africa.[106]

8.3 Implementation

Another way to classify projects, besides by impact pathway, is by channel. The examples in Chapters 4-6 showed that the Dutch food security policy has been implemented in various ways:

1. Activities contributing to *international policy dialogue*, food security strategies, and an environment enabling others to work on food security. UN organisations such as FAO and trade organisations such as WTO play important roles at this level.
2. Projects working on the *enabling business environment* in partner countries, not working directly with final beneficiaries but, for example, working on national policy, strategic coordination, or business environment and infrastructure. FAO often supports policy and coordination, while the World Bank supports the improvement of infrastructure and the business environment.
3. Large-scale *programmes with direct impact on the rural population*, often smallholder farmers. These programmes are often implemented by the government, co-managed by a multilateral organisation, and funded by several donors. IFAD and the World Bank often play such a co-management and funding role, while FAO often plays a technical assistance role. Within this group of programmes, one can distinguish two types: more extensive ones reaching many beneficiaries, with relatively low expenditure per beneficiary and with modest effects that are hard to measure; and more intensive programmes, reaching fewer beneficiaries, with higher expenditure per beneficiary, but with larger and better measurable effects.
4. *Innovative projects*, testing new practices on a small scale. These will not impact large numbers of beneficiaries directly (nor should they try to), but proven results can be fed into the larger programmes described above. This combination of small innovative programmes and large programmes is referred to as speedboats (or tugboats) and tankers. There are several examples of this in the food security programme in Ethiopia.

[106] This fits in well with the recent policy emphasis on reducing food loss and food waste.

Innovation versus scale

The optimal balance between the types of projects at country level depends on the country. It will depend on the country's financial resources and the government's capacity for setting policies and coordinating donors. Ideally, there is a link between these different types of projects. Examples of such links are found among others in Ethiopia, and are discussed in Chapter 9 on policy coherence and synergy.

Many projects start by spending proportionally more money on fewer farmers as a pilot, gradually increasing the number of beneficiaries, and hoping that national governments or other programmes will replicate and scale up at low cost. The country evaluation of Bangladesh concludes that there is a need to scale up the effects of relatively expensive projects cheaply, either through government policies and programmes, or through private sector and market transformation. For example, SAFAL has had proven impact on about 50,000 farmers and the country evaluation team concludes that some of the successful activities now need to be replicated by other public or private actors, to reach many more farmers. In practice, many activities are not suitable for a low-cost scaling up. For example, the marshland development programme in Rwanda, with high costs per farmer and showing substantial production effects, is unlikely to be copied on a low-budget scale by the government or others. The IFAD Char Development programme in Bangladesh underwent a similar discussion: the benefits were high, but so were the costs. As a result, scaling up is not realistic, unless proportional funding is ensured. In sum, it is often assumed that innovations will be scaled up, but an explicit scaling-up strategy is often lacking. Moreover, there is no rigorous evidence available that can validate this assumption.

Perhaps more problematic is when objectives of innovation and scaling up are combined in a single short-term project. A number of projects financed by the Netherlands are supposed to be both innovative and to achieve impact on a large scale in a relatively short project period (3-5 years). This is unrealistic and carries the risk that unproven technologies and approaches are scaled up. An example is the Geodata for Agriculture and Water (G4AW) programme, which contains projects that develop very innovative products and services that are certainly worth testing. Some of these projects, however, have very ambitious, short-term scaling-up targets, which may compromise thorough innovation development.

Choice of funding mechanism

In general, the implementation of the food security policy is mainly financed through grants. Grant-supported organisations may, however, provide conditional loans to governments (e.g. IFAD) or to the private sector (e.g. IFC-GAFSP), or provide the private sector with subsidies (e.g. RVO-FDOV). The motive behind the choice of a particular type of funding is not always clear.

The type of funding is an important determinant of efficiency. The fact that IFAD, for example, provides governments with a loan instead of a grant has positive effects on the programme ownership and encourages the recipient government to think in terms of cost-effectiveness (IOB, 2017). Another example was observed in Uganda, where two different funding mechanisms were used for two very similar interventions involving

investments in cooling equipment and dairy farmer training. Pearl, a financially well-organised international company, received a loan from GAFSP, but also had access to commercial loans that could have served the same purpose; meanwhile UCCCU, a Uganda cooperative union with less convincing financial and organisational strength, received a 50% subsidy from the Dutch embassy project. However, some of the member cooperatives still struggled to repay the loan taken out to enable them to meet the requirement of 50% own contribution.

Other intermediate programmes provide subsidies and require co-funding. For example, FDOV requires 50% co-financing. This way the Ministry of Foreign Affairs aims at catalysing private sector money with ODA. In order to have such a leverage effect, it is important that the ODA is additional and does not crowd out private funds. These types of public-private partnerships are discussed below.

Public-private partnerships for food security

Dutch food security policy supports private sector development by using a dual approach: by working on the enabling business environment (e.g. access to finance or infrastructure) and by directly supporting companies, often in a public-private partnership. There may be a positive spill-over effect of public-private partnership results to the sector or business environment. Public-private partnerships are expected to have several advantages: ODA leverages private sector knowledge and funds for development objectives; the private sector can effectively reach the bottom-of-the-pyramid consumers; and financial sustainability is assured by profit for the private sector. But public-private partnerships also have risks: public and private interests may not be well aligned; public funding may not lead to additional developmental results; activities may not be inclusive for poorer farmers or poorer consumers; and individual results may not be scaled up within the sector or system beyond the companies and beneficiaries directly involved (IOB, 2013).

Dutch food security policy has at its disposal several instruments for directly supporting the private sector, all of which are in essence different types of public-private partnerships. Some of these have recently been evaluated or reviewed: (1) Fund for Sustainable Entrepreneurship and Food Security (FDOV) managed by RVO; (2) the IFC-managed Private Sector Window of GAFSP; (3) 2SCALE, the IFDC-managed public-private partnership programme in Africa; and (4) the Sustainable Trade Initiative (IDH) working on a number of global commodities.[107] The effectiveness of these programmes was presented and discussed in Chapter 4. This section discusses some of the general challenges facing public-private partnerships for food security.[108, 109]

Evaluations show that the private sector brings in innovations and new practices, with support from private funds. The evaluation of the German BMZ 'developPPP.de' programme

[107] IDH was paid from the food security budget up to the end of 2013, and since 2014 has been paid from the private sector development budget.

[108] The effectiveness of these programmes was presented earlier under the value chain development pathway.

[109] Besides projects funded from the food security budget, the Dutch private sector development policy supports many initiatives in the agricultural sector, many of which also contribute to food security objectives.

by Deval (Hartmann et al., 2017) confirms this: the programme contributed to knowledge and technology transfer in developing countries. The GAFSP mid-term review showed that the total of USD 209 million GAFSP loans had leveraged about USD 400 million commercial IFC loans and USD 600 million funding by other sponsors and investors. It may be more difficult, however, to align public and private objectives. The PBL study on public-private partnerships (Bouma and Berkhout, 2015), which used FDOV as an example for public-private partnerships in food security, concluded that public-private partnerships often had a clear business case, but that the public objectives, notably the inclusiveness for smallholder farmers, were unclear. The IDH review (IOB, 2014a) comes to a similar conclusion: the public objectives (farmer income, environment, labour conditions) receive less attention than the private objectives (volume and market share of certified and traded commodity), which is also reflected in their project monitoring (see Chapter 4). The evaluation of the German public-private partnerships programme confirms this: the public-private partnership leverages private capital for development purposes if there is sufficient overlap between public and private objectives. However, due to the tension between private and public objectives, the desired synergy and development results are often not achieved.

One of the reasons why food security objectives might be less clear in private sector development activities such as the abovementioned programmes is the ambition to combine different objectives in one instrument, i.e. supporting food security, promoting economic development, and helping Dutch companies to succeed abroad.[110] These objectives do not necessarily coincide. For example, the Ministry of Foreign Affairs (and the Netherlands Enterprise Agency RVO) were not too demanding about what food security effects need to be achieved if Dutch enterprises are involved. Thus, initially in FDOV a proposal could aim for either private sector development objectives or food security objectives, although in practice, most funded proposals aimed for both objectives at the same time. However, the FDOV's funding requirements did not specify the food security results to be achieved.

There are examples of public-private partnerships in which the public food security objectives have a more prominent place in the project proposal. One is the PROOFS project in Bangladesh supporting local small-scale enterprises to deliver food and nutrition security services (nutritional sales agents, latrine builders). The project campaigns to create demand for these services among the bottom-of-the-pyramid consumers. Other examples are food fortification initiatives initiated and implemented by the private sector, supported by public efforts in multi-stakeholder dialogue to involve the industry sector and by government regulations or by public campaigns to create consumer demand (Hoddinott, 2015).

The evaluations of FDOV (KIT, 2016) and 2SCALE (Oomes et al., 2017)presented in Chapter 4 confirm that public-private partnerships lead to more innovations and, under the right circumstances, have developmental effects, but they cannot convincingly prove the additionality of these two funds. The mid-term review of FDOV distinguishes financial

[110] These three objectives correspond with the overarching policy on aid trade and investment (Ministerie van Buitenlandse Zaken, 2013b).

additionality from developmental additionality. It concludes that financial additionality will be larger in public-private partnerships led by smaller and local companies than in public-private partnerships led by multinationals, which have larger resources and can access other funds more easily. The development additionality found in FDOV (and in IDH) is mainly in the scale and pace of project implementation. Development additionality has also been found, though to a lesser extent, to be more inclusive of smallholder farmers, in the choice of partners (often including knowledge institutes of NGOs) and in daring new business models whose risk is absorbed by public funding. The GAFSP mid-term review included field studies of four projects, concluding that one had low additionality, two had medium additionality and only one had high additionality and that the additionality criteria had not been sufficiently developed (Platteau et al., 2016).

There may be a trade-off between a strong business case and the development additionality. In the case of a loan, this is less problematic because a strong business case will assure loan repayment, will cost less ODA, and would thus require lower additionality.

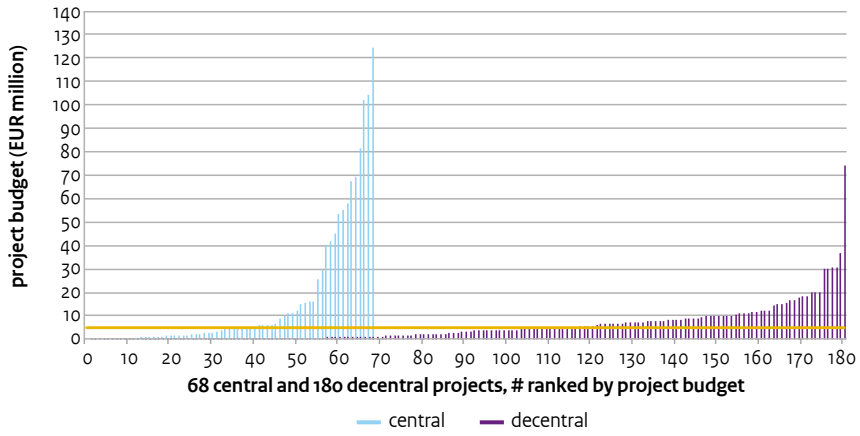
The PBL evaluation points at the potential change in the sector beyond the companies directly supported, if public-private partnership experiences are shared though multi-stakeholder platforms within the sector. None of the three FDOV projects studied were connected to existing extension services or local authorities, which limits the scaling up of innovations or best practices. This is partly due to the design of the public-private partnership programme: such scaling up in the sector and information sharing with competitors was not included as an objective. The GAFSP mid-term review found limited evidence of demonstration effects that motivate others to enter the market. The Deval evaluation concludes that project results are sustainable and continue beyond project duration, but are rarely scaled up beyond the companies directly involved with their limited number of final beneficiaries, so rarely result in sector or market transformation. The IDH evaluation pointed out that two types of work need to be in balance: for implementation on the ground, support to individual companies is needed, in the so called 'competitive space', while for systemic change and transformation throughout the sector, multi-stakeholder dialogue is needed in the so-called 'pre-competitive space'. A problem is that companies may not be eager to share information with their competitors. The companies involved confirmed the importance of IDH's work in this pre-competitive space. These results raise the question of finding the right balance between working on the business environment and sector-wide development on the one hand, and, on the other hand, supporting companies directly in public-private partnerships and effectively linking the two. This policy review is unable to answer this question, which is at the core of private sector development. Given the uncertainty and current debate about this subject in various international forums (DCED, OECD), this review recommends further investigation of this question.

8.4 Operational costs

There is also a third way of looking at efficiency: the operational costs incurred by the Ministry of Foreign Affairs. In general, the actual and perceived pressure of work at the Ministry, at embassies and in The Hague, is very high and has been increasing in recent years. One of the reasons for the growing workload is that since 2011 the Netherlands has been transitioning from programme aid (budget support and pooled and basket funding) to project aid. This is despite the overwhelming consensus in the literature that programme aid is more effective, efficient, and sustainable than project support (see for instance (Bigsten et al., 2011; IOB, 2012; Van Lieshout et al., 2010), the fact that in the Paris Declaration (2005) development partners agreed to provide more programme aid, and the agreement among European donors to coordinate their policies and to reduce fragmentation. For Dutch food security policy, the large number of activities (many of them small: see Figure 8.1) has created a highly fragmented approach, which has contributed to a high workload for the Ministry, in The Hague and at embassies.

Figure 8.1 shows that a large proportion of the activities funded through the food security budget have a budget smaller than EUR 5 million. This is the case not only for activities managed from the embassies (109 out of 180), but also for activities managed from the Netherlands (35 out of 68). It is not possible to compare the central budgets with the decentralised budgets. The larger central budgets are contributions to multilateral organisations or to larger implementing agencies (such as RVO or Dutch NGOs). While it may seem more efficient to allocate larger budgets to these implementing agencies, in practice these agencies will also be confronted with the costs of managing the portfolios of smaller projects. Nevertheless, it should be possible to reduce the administrative costs by reducing fragmentation (see for instance Bigsten et al., 2011).

Figure 8.1 *Food security projects funded by the Ministry of Foreign Affairs 2012-2016, ranked by project budget, distinguishing projects managed from The Hague (central) and projects managed from embassies (decentral)*



Source: Ministry of Foreign Affairs.
The golden horizontal line indicates the average project budget.

In order to give an impression of the administrative burden, we calculated what the effects would be of embassies and central departments not supporting activities with a budget below EUR 5 million. For 2016, this would have reduced the number of food security activities of the embassies from 130 to 48.[111] Assuming that total budgets and expenditure remain unchanged, this could result in the embassies' workload (for food security) being reduced by 20%.[112] The equivalent calculation for headquarters is more difficult. However, applying the same calculation as for the embassies, we estimated that the effect would be a reduction of about 15% (in terms of the time spent on food security projects).

8.5 Synthesis

This chapter aimed at assessing the efficiency of the Dutch food security. The chapter started with the assertion that the assumptions underlying the standard RPE question on efficiency are not met in current Dutch food security policy. An evaluation of efficiency requires: (a) homogenous policies; and (b) reliable information about the costs and benefits of comparable interventions. These conditions are not met by Dutch food security policy, with the result that we have been able to present the results of only a few evaluations of the cost-effectiveness of interventions. Only three evaluations of Dutch-funded projects provided enough information to allow the benefits to be quantified. The results of these evaluations, as well as those of other studies, show large variation in cost-benefit ratios. The IOB systematic review of different pathways to food security (2011) concluded that both breeding and distributing disease-tolerant crop varieties and applying biological disease control were very cost-effective ways of reducing production losses, thereby improving food security for large groups of farmers, including for poorer subsistence farmers and farmers in Africa.

Additionally, the chapter aimed at assessing the efficiency of various aid channels and funding mechanisms. The implicit assumption is that a combination of different types of activities at strategic policy level and at operational level (working with farmers and the private sector) creates synergy by providing input and feedback between policy dialogue and field operations. Similarly, it is assumed that innovative bilateral projects are scaled up by large-scale national programmes funded by multiple donors and that this creates leverage. However, except for a few good examples, there is not much robust evidence to support these assumptions.

These assumptions on synergy and leverage have contributed to the implementation by the Netherlands of a heterogeneous mix of projects through different channels, using various funding mechanisms. It is, however, difficult to discern a systematic aid architecture in which the modality chosen is clearly motivated. Large-scale projects have been implemented without much evidence about their effects. On the other hand, the Ministry supported innovative small-scale projects, expecting that they would be scaled up if successful, but often without a strategy being in place to achieve this objective.

[111] A consequence – and potential downside – is that there would be less room for many small innovative projects.
[112] This figure was calculated using the results of an internal analysis based on data for 2011.

Public-private partnerships are increasingly being used as funding mechanism. They have several potential advantages, including the leverage of private sector knowledge and finance, a reach extending to large groups of producers, employees, and consumers, and financially sustainable market-based solutions. However, public-private partnerships also have the risk of limited additionality, private interests overshadowing public interests, and limited inclusiveness of smallholder farmers. More investigation is needed: (i) to identify the right conditions for different types of public-private partnerships to effectively and efficiently contribute to public objectives; and (ii) to find the optimal balance between direct support through public-private partnerships and support to the enabling business environment.

Finally, the implications for the operational costs of the Ministry were assessed. The implementation of 248 food security projects, many with relatively small budgets, leads to high operational costs for staff at embassies and the Ministry and hence to limited attention for professional supervision and monitoring and evaluation, to the detriment of the efficiency of the food security programme.

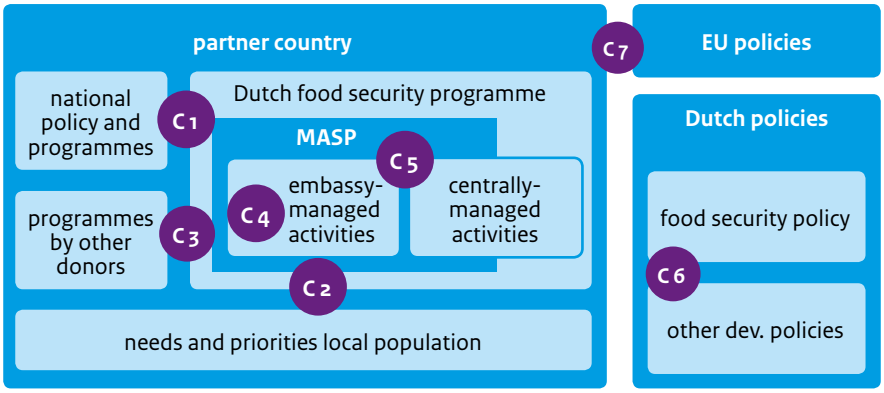
9

Policy coherence

9.1 Introduction

Food insecurity is a multi-facetted problem that requires a combination of interventions by the Netherlands and by other development partners. To achieve food security it is therefore essential that there is coherence and synergy between the different policies and interventions. This chapter examines the coherence at three levels (Figure 9.1): between the Dutch food security programme and the partner country context (C1, C2, C3), within the Dutch food security programme (C4, C5), and between the food security policy and other Dutch development policies (C6) and EU policies (C7).

Figure 9.1 *Policy coherence issues between the Dutch food security programme and its country context, within the Dutch food security programme and between the food security policy and other policies*



MASP = Multi-Annual Strategic Plans.

Different policies have laid down clear intentions for coherence. The food security policy acknowledges the important role embassies play in assuring synergy of the various food security projects (whether managed centrally or by embassies) in partner countries: embassies know the context and are in policy dialogue with government and other donors. The policy on aid, trade, and investments recognises the risk of policy incoherence when the interests of the Dutch economy and Dutch private sector are combined with development objectives.

The two main conclusions are that there is scope to improve coherence and synergy: (1) within the Dutch food security portfolio of embassy-managed and centrally-managed projects; and (2) between the food security policy, the policy on NGO and civil society support, and the policy for aid, trade, and investment.

9.2 Coherence of the Dutch food security programme in partner country context

The four IOB country evaluation reports and the interviews by the IOB evaluators in the partner countries and at the Ministries of Foreign Affairs and Economic Affairs yielded the following insights on synergy and coherence.

C1. Alignment with government policy
The food security programmes in the Multi-Annual Strategic Plans (MASP) developed by the embassies are generally well aligned with host government policies. The national government clearly communicates to the embassy what role it would like them to play, especially in countries with a strong, decisive government, (e.g. in Ethiopia and Rwanda).

C2. Relevance for the needs and priorities of the local population
The food security situation in the partner country is briefly described in the embassy multi-year strategic plan, but often lacks a more thorough analysis that underpins the intervention logic of the programme and projects. An analysis of the country and sector strategies as well as of individual project documents shows that food security programmes and projects are, however, improving the underlying theory of change and intervention logic: it is becoming clearer how they are working on food availability and food access and for whom, and projects are paying more attention to nutrition. Embassies have expressed interest in studying the food security effects of developing the commercial agricultural sector.

For projects that work on capacity building of government institutions, there is some frustration and doubts at the embassies about the impact this will have on food-insecure people. There is discussion about better linking institutional development work with practical work on the ground. In Uganda, for example, the embassy has created such a link between working on value chains with the private sector and working on the enabling business environment, e.g. by lobbying for reducing the barriers encountered in commercialisation.

C3. Coherence with other donor-funded programmes
In general, there is weak donor coordination; many donors pursue their own programmes. There are, however, some good examples of synergy between Dutch food security projects and other food security programmes. In Ethiopia, for example, the Netherlands has supported a number of smaller and innovative projects involving Dutch knowledge institutes, whose experiences in the form of 'proven practices' have been fed into a larger multi-donor programme led by the government and the World Bank. This combination is a successful innovation in aid architecture.

Coordination with food security programmes of other donors is better where the host government is active in donor coordination and technical working groups. Where the government is less active, more coordination effort is needed from development partners.

Generally, the Dutch embassies are active members of donor coordination and working groups and their role is appreciated by the government staff interviewed and by various multilateral organisations. In Rwanda, for example, the Ministry of Agriculture promoted crop intensification and specialisation in one main crop per district, whereas for food security, diversified agricultural production would be more beneficial. On the other hand, the Ministry of Health in Rwanda was concerned about nutritional status and health, and diet diversity, but without considering the link to agriculture. The Dutch embassy played an important role in setting up the secretariat for Food and Nutrition Security, bridging the gap between the Ministry of Agriculture and the Ministry of Health.

9.3 Synergy within the Dutch food security programme

C4. Synergy between Dutch food security projects

Generally, a large part of the Dutch portfolio of food security projects is fragmented in geographically and organisationally isolated projects. It therefore misses opportunities for an integrated approach and synergies. However, all embassies facilitate exchanges between different Dutch-funded food security programmes, through regular meetings. In Uganda this has resulted in collaboration between the seed sector project (ISSD) and the production and value chain project CATALIST, and between ISSD and the policy project (PASIC), for a better seed policy. In Bangladesh this has resulted in several joint projects in which different projects working in the same area have had different complementary expertise or experiences, e.g. in value chain development or approaches for water use organisations. In Ethiopia, there is regular exchange between projects working in the areas with agricultural surplus, and several bilateral projects in which Wageningen University and Research is involved have recently started sharing offices and are now working under an umbrella organisation. Nevertheless, in spite of some good examples and good intentions, there are still many projects working on different constraints in different areas that could greatly increase their effectiveness by working together: some of the missed opportunities are combining seed sector development with agricultural production, agricultural production with value chain development, community development with value chain development, and agricultural development with nutrition.

C5. Synergy between centrally-managed and embassy-managed food security programmes

The food security policy underlines the important role played by embassies in assuring synergy between centrally-funded food security projects and the embassy-managed food security programme. On the one hand, the embassy is more knowledgeable about country context. On the other hand, the Ministry of Foreign Affairs and the agency (RVO) that manages private sector instruments in the Netherlands are in close contact with Dutch knowledge institutes and private sector; this is valuable (e.g. when investing in innovations or sustainable value chains for the European market). There is therefore much scope for improving synergies: for example, by combining centrally- and embassy-managed efforts in the same geographical area for the same target group, or by combining the embassy's policy dialogue with national government with centrally-managed support to businesses.

There is concern at embassies that the centrally-managed food security programmes are not well aligned with the food security priorities in the MASP and bypass the policy dialogue the embassy has with the government. In some cases, the embassy was not involved in the call for, selection of, and monitoring of central projects. Recently this situation has improved, and the Ministry of Foreign Affairs has developed a code of conduct about communication, the division of roles, and embassy involvement in centrally-managed projects. The Fund for Sustainable Entrepreneurship and Food Security (FDOV) is an example where this coordination works well. The RVO country coaches in the Netherlands play a constructive role in their contact with embassies. Embassies should have a larger role in the selection, coordination, and monitoring of centrally-funded projects. This will, however, require additional staff time and capacity.

9.4 Coherence of Dutch food security policy with other Dutch development policies

C6. Coherence with other Dutch development policies

Food security and sustainable water management
There is synergy in various projects that combine water management for agriculture with food security. Several water management projects funded from the 'water policy' budget go beyond the availability of irrigation water: they have an inclusive approach towards poor smallholder farmers, include agricultural and market support to increase farmer production and income, and in some cases also have a specific farm diversification and nutrition component. The Bangladesh country case study report provides an overview of several 'water projects' with food security objectives.

Food security and gender
The IOB evaluation on gender in Dutch development policies (2015) investigated the gender effects of two types of food security projects: projects securing land tenure and projects supporting producer organisations.

The International Land Coalition, a global alliance of intergovernmental and civil society organisations, promotes secure and equitable access and control for women through knowledge sharing, policy dialogue, and capacity building. Although the coalition has incorporated gender in its strategic framework and all its activities, it does not report on the effects of its activities on women. The Global Land Tools Network has developed the so-called Gender Evaluation Criteria for Large-scale Land Tools, which are being used by its members. This has led to commitment from national governments, some of which have revised codes and laws in favour of land tenure security for women. The Dutch-funded land certification project in Burundi had marginal positive effects on women: only 6% of land certificates were issued to women and the traditional land use rights for women were at risk. The land certification project in Mozambique did have several positive results: new land certificates in the names of both the man and woman of the household; paralegals

considered women's land rights in land dispute resolution; and organised women's groups were entitled to receive a community land title. In Rwanda, land certificates had positive effects for legally married women and to a lesser extent also for women that were not legally married.

Agriterra (the main Dutch organisation supporting producer organisations) aims at ensuring women's participation. In all projects in which Agriterra was involved, women's participation had increased by up to 50% in 2013. Women were more active in producer organisations involved in processing and credit, and less involved in value chain development and policy formulation.

Food security and sexual and reproductive health and rights

The 2015 IOB evaluation found that synergies between food security and sexual reproductive health and rights were limited, but improving. As an example, the evaluation cited the case of Bangladesh, where women, especially adolescent girls and daughters-in-law, are often undernourished, overworked, and marry and bear children too early, which results in a vicious circle of undernourished mothers and children. To address this problem, the Dutch embassy in Bangladesh has included a special focus on sexual and reproductive health and rights in their food security programme.

Food security and building civil society through NGOs

Dutch partnerships of NGOs, funded from a separate budget line, work on building local civil society and address various topics, including food security and nutrition. However, the embassy is often unaware of these centrally-managed NGO projects. For example, at the embassy in Uganda they knew that there were 19 Dutch NGO partnerships active in Uganda, but they had no overview of who did what and where (at the time of the IOB visit in 2016, they had hired someone to coordinate this). At the same time, the embassy realised that these partnerships could make a valuable contribution (e.g. in nutrition awareness, or in creating demand for nutritious food), which could complement the embassy-managed projects in commercial agriculture.

Food security, private sector development, and the transition from aid to trade

The interviews conducted in The Hague revealed that there is clear understanding about the differences and overlap in policies between the Ministry of Foreign Affairs and the Ministry of Economic Affairs. If programmes are funded by ODA, then ODA objectives should be leading. There are rarely conflicts between the interests of these two ministries. If there are issues, these are usually discussed at the embassy, with the agricultural attaché and the head of development cooperation responsible for food security and then are fed back to the Ministry. For example, a discussion on seed potatoes in Ethiopia has indeed resulted in no exports of Dutch seed potatoes to that country, in order to allow the local seed potato sector to develop.

The broader policy agenda of aid, trade, and investment, whose underlying concepts have been discussed since the WRR report in 2010,[113] has had consequences on how Dutch embassies have designed the country food security programmes, especially in countries where the Dutch embassy anticipated a transition from an aid relationship to one based on trade. For example, in Uganda, the embassy looked for an overlap between the Dutch food security objectives and the opportunities for building economic relationships and involving the Dutch private sector: hence the focus on more favourable geographical areas and more commercially-oriented farmers. Working on nutrition was not seen as a topic through which the different Dutch policy objectives in Uganda could be combined. This also explains why the Dutch bilateral programme has not targeted more remote, poor and food-insecure areas – although these areas are still served by some of the multilateral organisations and NGOs that the Netherlands supports in Uganda.

There can be a trade-off between private sector development and food security, as found in some of the development instruments such as the RVO-managed FDOV and the IFC-managed GAFSP. Although both programmes include very good examples of projects with potential to contribute to the short- or long-term food security challenges, in general, these two instruments have fairly modest requirements for food security impact, both in design and in monitoring. FDOV proposals have to have either private sector development objectives or food security objectives (in practice, however, they often serve both objectives). GAFSP is open for proposals in low-income countries but does not stipulate working with, or for, poor or food-insecure people.

C7. EU policy coherence for food security

The coherence between the EU agricultural policy and the EU development policy for food security in developing countries has greatly improved. Since the EU production and export subsidies which resulted in low and volatile prices and discouraged production in developing countries have been replaced by direct income support, these negative market distortion effects have been reduced (Bureau and Swinnen, 2017). In spite of the EU policy coherence for development (PCD) work programme 2010-2013, the Common Agricultural Policy still contains some incentives for production in the EU that contribute to low world market commodity prices. Triggered by the concerns that arose after the 2007/08 food shortages, protectionists in the EU successfully lobbied for the continuation of direct payments in order to maintain and increase food production in the EU, with the justification that this would 'feed the world', but ignoring the potential negative effects in developing countries. Increased food production in the EU increases global food availability at affordable prices in the short term, but at the same time discourages farmers, food production, and agricultural development in developing countries, thus negatively affecting food security in the long term (Engel et al., 2013). However, these effects of the current EU policy are limited compared to the effects of the recently increased farm subsidies coupled to production in the United States, China, Indonesia, and Russia (Bureau and Swinnen, 2017).

[113] '*Less pretention, more ambition, development aid that makes a difference*' (Van Lieshout et al., 2010), which recommended, among other things, focusing on themes in which Dutch knowledge institutes and private sector have added value, including food security and water.

In an earlier study, IOB analysed the coherence of Dutch and EU policies in a simulation case study for Ghana, considering the policies on trade, migration, finance, and environment, and their effect on per capita income (IOB, 2014c). The evaluation concluded that more coherent non-aid policies would not have a large effect on per capita income, with two exceptions: (1) migration policies that restrict immigration of unskilled workers (reducing remittances to Ghana) but accept immigration of skilled workers (resulting in a brain drain from Ghana) would have a negative effect on per capita income; and (2) free access to the European market through an Economic Partnership Agreement would have a large positive effect on per capita income. According to the study, the two main reasons why European agriculture policy does not have a large impact on farmers in Ghana are that: (1) European and Ghanaian farmers are not competitors, but grow different crops; and (2) the agricultural supply in Ghana is inelastic in the short term.

9.5 Synthesis

Current Dutch food security policy is generally well aligned with host country government policies and the programmes of other development partners. Although there are some good examples of synergy achieved in the Dutch food security programme, many opportunities for synergy have been missed, due to limited context analysis, fragmentation of funds into a large number of geographically and organisationally isolated projects, and limited coordination between centrally-funded projects and the embassy-managed programmes. The embassies are in the best position to assure coherence and synergy, but are constrained by the large number of projects, independent organisational set-up of central programmes, and limited staff capacity.

The food security policy is coherent with the overall Dutch policies on international development cooperation and the specific policies of the four priority thematic areas of the Ministry. In some cases, synergy has been achieved between the policies of the different thematic areas: for example, by sustainable water management projects that also contribute to food security policy objectives. Another example where positive synergies were pursued is in Bangladesh, where there is a strong link between sexual and reproductive health and rights, and food security objectives. Coherence has been weak in other cases: for example, between food security and centrally-funded projects for NGOs to build civil society. This is, again, due to the independent organisational set-up of centrally-funded programmes. Coherence between the food security policy and the aid, trade, and investment policy is unclear, due to different perceptions in the hierarchy of the policy objectives, which risks resulting in trade-off, rather than synergy. The coherence between the Dutch food security policy and EU agricultural policy has improved greatly, but still requires more political will on the part of Member States in order to improve coherence.

10

Policy options for significantly less or more financial means (-/+ 20%)

10.1 Introduction

The Order on Periodic Evaluation and Policy Information (RPE) of 2015 prescribes that policy reviews contain one or more so-called '20% saving options': different policy options and their impact in case of significantly lower budget available. In addition, options for a reverse scenario of 20% higher budget can be explored. This chapter offers two 20% savings options, as well as two options for increasing the budget by 20%. It is formulated by the Inclusive Green Growth Department and the Sustainable Economic Development Department of the Ministry of Foreign Affairs. IOB does not assume any responsibility for the text of this chapter.

10.2 Scenario 1: 20% budget decrease

During the period 2012-2016, annual expenditure on food security was stable, at around EUR 300 million per year (see figure 3.2 on page 20). About two-thirds (68%) of the total budget was disbursed through the bilateral channel and about one-third (31%) through the multilateral channel. About 44% of the budget (65% of what is channeled bilaterally) was delegated to embassies. The remainder was financed centrally from The Hague.

In this paragraph two policy options are presented in case the Dutch government would choose to spend significantly less ODA on the theme of Food and Nutrition Security. As point of reference for this downsizing we take the projections of the food security expenditures of the 2018 budget under article 2.1.

Option 1: equal generic cuts

IOB concludes that the food security program has been effective where it invested in already proven activities, like food supplements, food fortification, agricultural research and extension and rural infrastructure, while working through the traditional multilateral, NGO and government channels. Regarding new approaches, like value chain development and working in public-private partnerships, evidence for effectiveness is still mixed and limited. This calls for more studies on the effectiveness of new approaches, it is not to conclude that more emphasis should be put on what is proven and not to explore new pathways. On the contrary, IOB recommends a broad and flexible approach to food security in which different, but connected pathways should be followed while putting undernourished people at the center of analysis and design.

Because the review does not contain evidence leading to options for more effectiveness and/or efficiency of the total portfolio by exclusive programming choices, in terms of prioritizing certain intervention types or channels, as a first option equal generic cuts are proposed which amount to an across-the-board 20% budget cut for all sbe's for Food Security. Consequence of such a cut is a decrease in contribution from the Netherlands to the realization of the targets of SDG 2. Relative to the current projection for 2020 of the

results indicators for food security (20 million children with improved food intake, 5 million smallholders with increased productivity and income and 5,5 million hectares of land better managed), it is estimated that in 2021 (with 20% budget cut) food intake of 4 million children will not improve, productivity and income of 1 million smallholders will not increase and land use on 1,1 million hectares will not become more sustainable.

Table 10.1 Options for 20% decrease (in EUR x 1000)

	2018	2019	2020	2021	2022
Eradicate existing undernourishment (sbe 1702U01070002)	22.000	25.000	29.000	29.000	29.000
Options:					
1. Equal generic cuts		-1.450	-2.900	-4.350	-5.800
2. Differentiated generic cuts		+1.293	+2.586	+3.879	+5.172
Promote inclusive and sustainable growth in the agricultural sector (sbe 1702U01040003) [114]	57.754	59.600	64.000	64.000	64.000
Options:					
1. Equal generic cuts		-3.200	-6.400	-9.600	-12.800
2. Differentiated generic cuts		-7.457	-14.914	-22.371	-29.828
Realise ecologically sustainable food systems (sbe 1702U01030002)	30.000	33.595	35.145	35.145	35.145
Options:					
1. Equal generic cuts		-1.757	-3.514	-5272	-7.029
2. Differentiated generic cuts		-0.243	-0.486	-0.730	-0.973
Knowledge and capacity development (sbe 1702U01050003) [115]	53.800	54.000	55.000	55.000	55.000
Options:					
1. Equal generic cuts		-2.750	-5.500	-8.250	-11.000
2. Differentiated generic cuts		-2.750	-5.500	-8.250	-11.000
Food Security decentral (embassy programs, sbe's 1702U01010001 - 1702U010100015)	173.750	167.100	156.150	156.150	156.150
Options:					
1. Equal generic cuts		-7.807	-15.615	-23.423	-31.230
2. Differentiated generic cuts		-7.807	-15.615	-23.423	-31.230
Total Food Security budget (ref. 2018)	**337.295**	**339.295**	**339.295**	**339.295**	**339.295**
Total budgetary cuts Absolute Percentage		 -16.965 -5,0%	 -33.930 -10,0%	 -50.894 -15,0%	 -67.859 -20,0%

[114] Including contributions to IFAD and FAO, under sbe 1702U01040002 (Multilateral Cooperation).
[115] Including contribution to the NICHE program, under sbe 1702U01050002 (Higher Education).

Option 2: differentiated generic cuts

IOB concludes that the emphasis of the food security policy during the period concerned was predominantly on agricultural development, and relatively less on nutrition and ecological sustainability. This is reflected in budgetary terms, where yearly expenditures on agricultural development (sbe's 1702U01040003 and 1702U01040002) are significantly higher than those on nutrition (sbe 1702U01070002) and ecologically sustainable food systems (sbe 1702U01030002). This is even more the case for the decentral part of the food security programs, but not visible because the embassies use one overall food security sbe per country (sbe's 1702U01010001 - 1702U010100015). Although the review contains no explicit conclusions or recommendations with regard to the spreading of the budget over the sub-objectives and related results areas of the food security policy, the recommendation to broaden the approach to 'food systems' and to put undernourished people at the center of analysis and design of interventions can be implemented by bringing expenditures (and thus results) on nutrition and ecological sustainability on a similar level to those on agriculture. This implies a re-allocation of financial means between the sbe's of the central budget, on top of the 20% cut: the budget for agricultural development nearly halves, the budget for ecologically sustainable food systems decreases only slightly and the budget for nutrition increases. In the decentral food security programs of the embassies a similar shift can be realized, but within the same sbe (not visible in the budget). Important to note here that at the same time integrated approaches (like nutrition-sensitive and climate-smart agriculture) , that fit under more than one sub-objective or sbe, are pursued as much as possible.

Compared to 2020 projections on the indicators for food security, in this option in 2021 food intake of 7 million more children will improve. The projection for sustainable land use remains more or less the same. Flip side is that productivity and income of 2,5 million smallholders will not increase and so less support is given to economic growth in the agricultural sector. This against the background that especially in Africa a significant increase in food production is required while improving economic viability and competitiveness of the agricultural sector.

10.3 Scenario 2: 20% budget increase

IOB concludes that the Dutch food security policy has positively contributed to fighting undernourishment and boosting agricultural productivity and income. At the same time the issues of hunger, undernourishment and poverty among smallholder farmers remain urgent and the Netherlands' knowledge and know how in international food and agriculture has a key role to play in this respect.

In this paragraph two policy options are presented in case the Dutch government would choose to spend significantly more ODA on the theme of Food and Nutrition Security. Point of reference are the projected expenditures on food security of the 2018 budget under article 2.1.

Option 1: equal generic increase

As argued under the first scenario, the review does not lead to exclusive choices for certain intervention options or channels that would improve effectiveness and/or efficiency of the total portfolio. Therefore, parallel to the option of equal generic cuts, an across-the-board 20% budget increase for all sbe's for Food Security is proposed here as a first option.

Table 10.2 Options for 20% increase (in EUR x 1000)

	2018	2019	2020	2021	2022
Eradicate existing undernourishment (sbe 1702U01070002)	22.000	25.000	29.000	29.000	29.000
Options:					
1. Equal generic increase		+1.450	+2.900	+4.350	+5.800
2. Differentiated generic increase		+5.565	+11.129	+16.693	+22.258
Promote inclusive and sustainable growth in the agricultural sector (sbe 1702U01040003) [116]	57.754	59.600	64.000	64.000	64.000
Options:					
1. Equal generic increase		+3.200	+6.400	+9.600	+12.800
2. Differentiated generic increase		-3.186	-6.371	-9.556	-12.742
Realise ecologically sustainable food systems (sbe 1702U01030002)	30.000	33.595	35.145	35.145	31.145
Options:					
1. Equal generic increase		+1.757	+3.514	+5272	+7.029
2. Differentiated generic increase		+4.028	+8.056	+12.085	+16.113
Knowledge and capacity development (sbe 1702U01050003) [117]	53.800	54.000	55.000	55.000	55.000
Options:					
1. Equal generic increase		+2.750	+5.500	+8.250	+11.000
2. Differentiated generic increase		+2.750	+5.500	+8.250	+11.000
Food Security decentral (embassy programs, sbe's 1702U01010001 - 1702U010100015)	173.750	167.100	156.150	156.150	156.150
Options:					
1. Equal generic increase		+7.807	+15.615	+23.423	+31.230
2. Differentiated generic increase		+7.807	+15.615	+23.423	+31.230
Total Food Security budget (ref. 2018)	**337.295**	**339.295**	**339.295**	**339.295**	**339.295**
Total budgetary increase					
Absolute		+16.965	+33.930	+50.894	+67.859
Percentage		+5,0%	+10,0%	+15,0%	+20,0%

[116] Including contributions to IFAD and FAO, under sbe 1702U01040002 (Multilateral Cooperation).
[117] Including contribution to the NICHE program, under sbe 1702U01050002 (Higher Education).

Consequence of such an increase is a higher Dutch contribution in realizing the targets of SDG 2. Relative to the current projection for 2020 of the results indicators for food security (20 million children with improved food intake, 5 million smallholders with increased productivity and income and 5,5 million hectares of land better managed), it is estimated that in 2021 (with 20% budget increase) food intake of an additional 4 million children will improve, productivity and income of an additional 1 million smallholders will increase and land use on an additional 1,1 million hectares will become more sustainable.

Option 2: differentiated generic increase

As under the first scenario, the recommendation to broaden the approach to 'food systems' and to put undernourished people at the center of analysis and design of interventions can be implemented by bringing expenditures (and thus results) on nutrition and ecological sustainability on a similar level than those on agriculture. This implies a reallocation of the increase in financial means, in such a way that expenditures on nutrition and on ecologically sustainable food systems are brought to the same level as those for agricultural development. As a consequence, the budget for agricultural development still drops by 20%, while the budgets for nutrition and for ecologically sustainable food systems increase by 75% and 45% respectively. In the decentral food security programs of the embassies a similar shift can be realized, but within the same sbe. Once more, it is important to note here that at the same time integrated approaches (like nutrition-sensitive and climate-smart agriculture), that fit under more than one sub-objective or sbe, are pursued as much as possible.

Compared to 2020 projections on the indicators for food security, in this option in 2021 food intake of an additional 15 million children will improve, as well as sustainable land use on an additional 2,75 million hectares. The cost of this reallocation is that, like in the generic budget cut scenario, productivity and income of 1 million smallholders will not increase and so less support is given to economic growth in the agricultural sector.

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Annexes

Annex 1 Classification of countries based on prevalence and progress rates of undernourishment and stunting

(in bold the Dutch Partner countries)

		Low prevalence of stunting (<23%)		High prevalence of stunting (>23%)	
		Good progress on stunting (=<-3%/year)	Poor progress on stunting (<-3%/year)	Good progress on stunting (=<-3%/year)	Poor progress on stunting (<-3%/year)
Low prevalence of undernourishment (<10.5%)	Good progress on undernourishment (<-1.9%)	Jordan Maldives Peru Morocco **Ghana** Azerbaijan Algeria China Kyrgyzstan	Tunisia Egypt Turkey Suriname Uzbekistan Paraguay		Gambia Cameroon Niger **Mali** **Indonesia** Nigeria Sao Tome and Principe Nepal **Benin**
	Poor progress on undernourishment (>-1.9%)	Kuwait Senegal Armenia Thailand Iran Mexico Chile Panama Gabon Malaysia Venezuela Uruguay Georgia Oman Brazil Costa Rica	Kazakhstan Republic of Korea Jamaica Belize Colombia		Vanuatu South Africa
High prevalence of undernourishment (>10.5%)	Good progress on undernourishment (<-1.9%)	Bolivia Dominican Republic Vietnam Guyana	Nicaragua	Philippines Cambodia **Bangladesh**	Djibouti Laos **Mozambique** Myanmar Togo Malawi **Ethiopia** Solomon Islands Angola
	Poor progress on undernourishment (>-1.9%)	Namibia Honduras Mongolia	Sri Lanka Iraq Haiti El Salvador	**Afghanistan** Zimbabwe Guinea-Bissau Congo Sierra Leone Cote d'Ivoire Democratic People's Republic of Korea Swaziland **Kenya** Liberia	Pakistan Botswana Timor-Leste Chad Tanzania Madagascar Guatemala Central African Republic Guinea Zambia **Uganda** Ecuador **Yemen** India **Rwanda** Burkina Faso Lesotho Tajikistan

Progress indicators are based on average annual change for undernourishment over the period 1990-2015 (as calculated by the authors), and for annual average change in stunting prevalence based on the available data points (as calculated by the Global Nutrition Report 2016). Source: FAO food security indicators database and International Food Policy Research Institute (IFPRI) (2015) 2015 Global Nutrition Report Dataset. Cut-off points (high/low) determined at the median value of the full dataset for all four indicators.

Annex 2 List of people interviewed

The Netherlands[119]

Marcel Beukeboom	Ministry of Foreign Affairs	IGG/Food security cluster, head
Paul van der Logt	Ministry of Foreign Affairs	IGG/Food security cluster, head
Jeroen Rijniers	Ministry of Foreign Affairs	IGG/Food security cluster
Frits van der Wal	Ministry of Foreign Affairs	IGG/Food security cluster
Melle Leenstra	Ministry of Foreign Affairs	IGG/Food security cluster
Mario Leeflang	Ministry of Foreign Affairs	IGG/Food security cluster
Wijnand van IJssel	Ministry of Foreign Affairs	IGG/Food security cluster
Robert Jan Scheer	Ministry of Foreign Affairs	DAF (DDE in 2013)
Marcel Vernooij	Ministry of Foreign Affairs (M. o. Agriculture in 2013)	DDE/Food Security cluster
Monique Calon	Ministry of Foreign Affairs	DDE/Food Security cluster
Aaltje de Roos	Ministry of Foreign Affairs	DDE/Food Security cluster
Hans Raadschilders	Ministry of Foreign Affairs	DMM
Gijs Zeestraten	Ministry of Economic Affairs	European Agricultural Policy Department
Johan Gatsonides	Ministry of Economic Affairs	European Agriculture and Fisheries Policy and Food Security Department

Bangladesh

Jan Willem Nibbering	Dutch Embassy Dhaka	Policy Officer Food Security (2014)
Laurent Umans	Dutch Embassy Dhaka	Policy Officer Food Security (2016)
Arman Khan	Dutch Embassy Dhaka	Policy Officer Food Security
Khaled Khaleduzzaman	Dutch Embassy Dhaka	Water management
Michiel Sloteman	Dutch Embassy Dhaka	Water management
Peter de Vries	Dutch Embassy Dhaka	Water management
Lon Zomer	Dutch Embassy Dhaka	Financial advisor
Mike Robson	FAO	Representative
Gopal Chandra Sarker	Ministry of Agriculture	Project Director, HILIP/CALIP; govt. rep. for IFAD project
Alamgir Chowdhury	Blue Gold	Consultant
Dirk Smits	Blue Gold	Team Leader
Victoria Pineda	Blue Gold	Component leader

[119] Our apologies for not having included all persons involved in the various group discussions, in the Netherlands and in the four partner countries, in this list.

Munir Ahmed	Blue Gold	Livestock Expert
Umme Asma Khanam	Blue Gold	Socio Economist
Abul Kalam Azad	Bangladesh Water Development Board	Superintending Engineer
Md. Mainuddin	Bangladesh Water Development Board	Executive Engineer
Selim Reza Hasan	Solidaridad	Country manager Bangladesh
Shatadru Chattopadhayay	Solidaridad	Managing director
Indu Bhusan Roy	Solidaridad	SaFal programme
Md Moziball Hique	Solidaridad	SaFal programme
Rudaba Khondker	GAIN	Country Director
Tahmina Begum	Ministry of Agriculture	Directorate of Agricultural Extension (DAE)
Rowshan Jahan Moni	ALRD (supported by ILC)	Council representative
Shamsul Huda	ALRD (supported by ILC)	Execitive Director
Muhammed Kamal Uddin	ARBAN (supported by ILC)	Head
Pallab Chakma	KAPEENG (supported by ILC)	Head
Shamin Murad	ACI, SNV, IDDS (Supported by G4AW)	(IDSS supported by G4AW)
Peter Jensen	DANIDA (supports DAE's work on FFS)	Representative

Ethiopia

Jan Willem Nibbering	Dutch Embassy Addis Abeba	Policy Officer Food Security (2016)
Gerrit Noordam	Dutch Embassy Addis Abeba	First Secretary, Food security & sustainable development
Hans van den Heuvel	Dutch Embassy Addis Abeba	Agricultural Councellor
Worku Tessema	Dutch Embassy Addis Abeba	Policy Officer Food Security and Sustainable Development
Eline van der Veen	Dutch Embassy Addis Abeba	Aid and Trade Officer
Lydia Tujuba Atomssa	Dutch Embassy Addis Abeba	Policy Officer SRHR/Gender
Joep van den Broek	Dutch Embassy Addis Abeba	Delegated Advisor Agriculture
Amadou Allahoury Diallo	FAO	Representative
Han Ulaç Demirag	IFAD	Country director and representative East and Southern Africa division
Tomaso Ceccerali	Alterra, CommonSense, (Supported by G4AW)	Project leader
Munir Duri	Kifiya, GIACIS (Supported by G4AW)	CEO

Megerssa Miressa	Kifiya, GIACIS (Supported by G4AW)	Programe Director
Eric de Vaan	Senselet Food Processing (Supported by FDOV)	Owner
Belete Woldegies	Nurture Education and Development (Supported by Edukans)	Execitive Director
Yalem Mulugeta	Nurture Education and Development (Supported by Edukans)	Programme Officer
Ato Keberu Belayner	Ministry of Agriculture	AGP Coordinator
Amsalu Ayana Aga	Integrated Seed Sector Development Programme.	Director
Marja Thijssen	CDI, Wageningen; ISSD-2 Ethiopia	Supervision ISSD-2 Ethiopia
Tewodros Zewdie	Ethiopian Horticulture Producer Exporters Association (Supported by EKN and Sustainable Flower Initiative / IDH)	Executive Director

Rwanda

Frédérique de Man	Dutch Embassy Kigali	Ambassador
Pieter Dorst	Dutch Embassy Kigali	Head of development cooperation
Brechtje Klandermans	Dutch Embassy Kigali	Coordinator Regional programme
Deo Musabyimana	Dutch Embassy Kigali	Policy Officer Food security
Jan Vlaar	Dutch Embassy Kigali	Policy Officer Water management
Esther Hogan	Dutch Embassy Kigali	Controller
Gaspard Ndagijimana	Dutch Embassy Kigali	Policy Officer
Teddie Muffels	Dutch Embassy Kigali	Agricultural Counsellor
Esther van Damme	Dutch Embassy Kigali	First Secretary economic development
Caro Pleisier	Dutch Embassy Kigali	First Secretary food security and PSD
Innocent Musabyimana	Ministry of Agriculture	Permanent Secretary
Attaher Maiga	FAO	Representative
Sanne Holtslag	FAO	Associate professional officer
Aimable Ntukanyagwe	IFAD	Country programme officer East and Southern Africa
Norbert van der Straaten	Holland Greentech (Supported by DFOV)	Director

John Veerkamp	IFDC, Catalist-2	Country Representative and Chief of Party
Thomas Hatangimana	IFDC, Catalist-2	National Agronomist
Laurence Mukamana	IFDC, Catalist-2,	Coordinator
Carine Rukera	IFDC, Catalist-2,	M&E officer
Katharina Jenny	Swiss Confederation	Deputy Regional Director DDC
Jan Vriens	Africa Improved Foods	Chief Operations Officer
Amar Ali	Africa Improved Foods (Supported by GAFSP)	Chief Executive Officer
Sanjay Kumar	Wood Foundation Africa (Supported by IDH)	Programme Director
J.P. Samuel Jayakumar	Kabuye Sugar Works (Supported by FDOV)	Senior Plantation Manager
M. Thiru Navukkarasu	Kabuye Sugar Works (supported by FDOV)	General Manager

Uganda

Henny Gerner	Dutch Embassy Kampala	Food security
Anno Galema	Dutch Embassy Kampala	Food security
Grace Babihuga	Dutch Embassy Kampala	Policy Officer
Yvonne de Haan	Dutch Embassy Kampala	Controller
Josephat Byaruhanga	Dutch Embassy Kampala	Food security
Hans Peter van der Woude	Dutch Embassy Kampala	Head development cooperation
Stephen Bayite-Kasule	Dutch Embassy Kampala	Policy Officer Agribusiness and Economic Diplomacy
Alhadji M. Jallow	FAO	Representative
Pontian Muhwezi	IFAD	Country Programme Officer
Clive Drew	aBi Trust, Dairy support programme	Agribusiness Director
Henry Mutabaazi	aBi Trust, Dairy support programme	Technical Expert Animal Production Systems
Ronald Wabwire	aBi Trust, Dairy support programme	Dairy Officer
Arinanye Clayton	UCCCU, Dairy support programme	General Manager
Mugana Daniel	UCCCU, Dairy support programme	Supply Chain Coordinator
Jim Mugangi	UCCCU, Dairy support programme	Dairy Value Chain Coordinator
Nuwagora George	UCCCU, Dairy support programme	Chairperson Board of Directors

Rinus van Klinken	SNV, The Inclusive Dairy Enterprise	Project manager
Taco Hoekstra	Agriterra	Agribusiness Advisor
Florence N.M. Kasirye	Dairy Development Auithority	Livestock Consultant
Robert Serwanga	Agriculture Reinsurance Consultants (Supported by G4AW)	Country manager
John Makosya	Agro Consortium, Uganda Insurances Association	(Supported by G4AW)
Bijoy Varhese	Pearl Dairy, Midland Group of Companies	(Supported by GAFSP)
Tucungwirwe	Value Addition Institute. Managing Director	(Supported by ARF)

Rome

Hans Hoogeveen	Dutch Permanent Representation	Permanent Representative / Ambassador
Wierish Ramsoekh	Dutch Permanent Representation	Deputy Permanent Representative
Klaas Pieter van der Veen	Dutch Permanent Representation	Trainee
Masahira Igarashi	FAO	Director of Evaluation
Daniel Gustafson	FAO	Deputy Director-General Operations
Alexander Jones	FAO	Director a.i., South-South Cooperation and Resource Mobilization Division
Rachel Sauvinet Bedouin	(Ex-FAO) IEA-CGIAR	former staff of FAO-OED, currently Head of IEA-CGIAR
Willem Bettink	IFAD	Program and Change Officer, Program Management Department
Luis Jiménez-McInnis	IFAD	Director, Partnership and Resource Mobilization Office
Paul Winters	IFAD	OiC Associate Vice-President, Strategy and Knowledge Department
Hisham Zehni	IFAD	Senior Results Specialist, Project Management Department
Sana F. K. Jatta	IFAD	Regional Director, East and Southern Africa Division
Shirley Chinien	IFAD	Regional Economist, East and Sothern Africa Division

Henrik Franklin	IFAD	Portfolio Adviser, East and Southern Africa Division
Thierry Benoit	IFAD	Country Programme Manager, Asia and the Pacific Division
James Garret	IFAD	Lead Nutrition Specialist, Policy and Technical Advisory Division
Juliane Friedrich	IFAD	Senior Technical Specialist, Policy and Technical Advisory Division
Oscar Garcia	IFAD	Director, Independent Office of Evaluation
Adolfo Brizzi	IFAD	Director, Policy and Technical Advisory Division
Edward Heinemann	IFAD	Lead Technical Specialist – Policy, Policy and Technical Advisory Division
Liz Nasskau	DFID	Deputy Permanent Representative to FAO and IFAD

Annex 3 Evaluations used, organised by pathway

Objective	Pathway	Project Name	Country	Act. nr	Budget (EUR million)	Expend. 2012-16	Start	End	Eval type*	Eval quality **	Reference
1. Ag.Prod.	1. Agricultural Research	CGIAR ag. Research (WB)	Worldwide	24392	124.7	150.0	Jan-12	Dec-16	Eval	Cat. 1	Birner and Byerlee, 2016
1. Ag.Prod.	2. Farmer training	Agricultural Growth Program (WB)	Ethiopia	23253	30.0	24.0	Sep-11	Dec-15	MTR	Cat. 3	Mid-term review mission, 2014
1. Ag.Prod.	2. Farmer training	FUPRO Recherche	Benin	24941	1.4	1.3	Nov-12	Jun-17	MTR	Cat. 4	David and Agbodjogbe, 2015
1. Ag.Prod.	2. Farmer training	High Value Crops (FAO)	Palestinian Terr.	24985	7.1	7.4	Dec-12	Jun-18	MTR	Cat. 3	Brand et al., 2015b
1. Ag.Prod.	2. Farmer training	CABI Plantwise	Worldwide	25550	5.0	5.0	Jan-13	Dec-17	Eval	Cat. 3	Evidence on Demand, 2015
1. Ag.Prod.	3. Value chain dev.	IDH	Worldwide	18162	67.6	34.0	Jul-08	Dec-16	Eval	Cat. 1	IOB, 2014a; Waarts et al., 2015, 2016
1. Ag.Prod.	3. Value chain dev.	Establishment of CBSC (Solidaridad)	Worldwide	18429	4.8	1.0	Dec-08	Dec-13	MTR	Cat. 3	Kessler, 2015
1. Ag.Prod.	3. Value chain dev.	GAFSP Impl. Voedselz.h. (IFC)	Regional Africa	23294	104.3	97.7	Oct-11	Dec-22	Eval	Cat. 4	Platteau et al., 2016
1. Ag.Prod.	3. Value chain dev.	FDOV	Worldwide	23877	81.5	38.6	Jan-12	Dec-22	MTR	Cat. 4	KIT, 2016
1. Ag.Prod.	3. Value chain dev.	ASPIRE (SNV)	Ethiopia	25032	6.6	6.1	Dec-12	Jun-18	MTR	Cat. 4	Holtland, 2015
1. Ag.Prod.	3. Value chain dev.	Integrated Seed Sector Dev.	Ethiopia	23448	10.2	6.8	Dec-11	Jun-16	IOB	Cat. 1	Ecorys-WUR-NMA, 2017

Objective	Pathway	Project Name	Country	Act. nr	Budget (EUR million)	Expend. 2012-16	Start	End	Eval type*	Eval quality **	Reference
1. Ag.Prod.	3. Value chain dev.	Seed sector development	Uganda	23617	5.2	4.6	Jun-12	May-17	MTR	Cat. 4	CDP, 2014
1. Ag.Prod.	3. Value chain dev.	Support Seed Multiplication	Mozambique	24728	3.9	4.4	Nov-12	Oct-16	Eval	Cat. 4	Matavele, 2015
1. Ag.Prod.	3. Value chain dev.	FONDS COMMUN PNSEB	Burundi	25233	8.0	8.0	Apr-13	Mar-16	MTR	Cat. 4	Stephens, 2015
1. Ag.Prod.	3. Value chain dev.	G4AW Faciliteit	Worldwide	25484	45.2	19.6	May-13	Dec-20	MTR	Cat. 4	De Winter and Noort, 2016
1. Ag.Prod.	3. Value chain dev.	Sustainable Palm Oil	Ghana	23342	12.1	11.5	Jan-12	Dec-16	MTR	Cat. 3	KPMG, 2015
1. Ag.Prod.	3. Value chain dev.	BAGC (AGDEVCO)	Mozambique	23447	8.2	5.0	Nov-11	Dec-16	Eval	Cat. 4	Carnegie Consult, 2013
1. Ag.Prod.	3. Value chain dev.	2SCALE (IFDC)	Regional Africa	23578	42.0	34.7	Apr-12	Mar-17	Eval	Cat. 3	Oomes et al., 2017
1. Ag.Prod.	3. Value chain dev.	Catalist-Uganda (IFDC)	Uganda	23616	15.0	14.2	Jun-12	Nov-17	MTR	Cat. 2	Bymolt, 2015
1. Ag.Prod.	3. Value chain dev.	Kenya Market Dairy Prog (SNV)	Kenya	24073	5.5	5.2	May-12	Feb-18	MTR	Cat. 4	De Jong et al., 2015
1. Ag.Prod.	3. Value chain dev.	SaFaL (Solidaridad)	Bangladesh	24552	12.0	13.0	Nov-12	May-17	IOB	Cat. 1	Aidenvironment-APE-BRAC-IHE, 2017
1. Ag.Prod.	3. Value chain dev.	CATALIST II (IFDC)	Great Lakes Reg.	24720	16.6	15.3	Apr-12	Dec-16	IOB	Cat. 1	AIID-PwC, 2017a
1. Ag.Prod.	3. Value chain dev.	PROOFS (ICCO)	Bangladesh	25477	10.0	9.0	Jul-13	Jun-17	MTR	Cat. 3	EDGE Consulting Ltd., 2016
1. Ag.Prod.	3. Value chain dev.	GHANAVEG (WUR)	Ghana	25795	4.0	2.6	Nov-13	Dec-18	MTR	Cat. 4	Joosten and Agboka, 2015

Objective	Pathway	Project Name	Country	Act. nr	Budget (EUR million)	Expend. 2012-16	Start	End	Eval type*	Eval quality **	Reference
1. Ag.Prod.	4. Natural resource mgt.	ASAP (IFAD)	Worldwide	24659	40.0	40.0	Nov-12	Oct-16	MTR	Cat. 4	Grist et al., 2015
1. Ag.Prod.	4. Natural resource mgt.	Intro rice cultiv marshlands (WHH)	Rwanda	25059	1.4	1.4	Dec-12	Dec-15	Eval	Cat. 4	Seebörger, 2014
1. Ag.Prod.	Multi-purpose	LDP S-Sudan (IFAD)	South Sudan	23857	5.0	5.0	May-09	Dec-16	Eval	Cat. 3	AESA, 2016
1. Ag.Prod.	Multi-purpose	Zambezi Valley Agency	Mozambique	24658	15.5	17.2	Nov-12	Dec-18	Eval	Cat. 3	Puetz et al., n.d.
1. Ag.Prod.	Multi-Purpose	Food Security & RE Fund (ICCO)	Ethiopia	24769	6.6	6.3	Sep-12	Dec-16	Eval	Cat. 3	Ton and Tilahun Eshete, 2016
2. Nutrition	5. Social safety net	PSNP Fase 3 (WB)	Ethiopia	20775	74.0	45.7	Nov-09	Dec-21	Eval	Cat. 1	Berhane et al., n.d.; Hoddinott et al., 2015
2. Nutrition	5. Social safety net	INAS II	Mozambique	24398	8.1	3.8	Nov-12	Dec-17	Eval	Cat. 2	Hodges et al., 2014
2. Nutrition	5. Social safety net	Fonds de Stabilisation (UNDP)	Mali	25252	4.0	4.0	Mar-13	Dec-16	MTR	Cat. 4	Diallo and Gnambele, 2014
2. Nutrition	5. Social safety net	Social Accountability (Helpage)	Mozambique	25752	0.8	0.8	Sep-13	Aug-17	MTR	Cat. 3	Dumangane and António, 2015
2. Nutrition	5. Social safety net	Participatory Forest Mgt	Rwanda	25812	7.5	6.8	Jul-13	May-17	MTR	Cat. 3	FRM Ingénierie, 2015
2. Nutrition	6. Food fortification	GAIN Schokland	Worldwide	19299	6.5	1.5	Feb-09	Dec-15	Eval	Cat. 3	van Gerwen and Van Ede, 2014
2. Nutrition	6. Food fortification	Driving Nutrition Impact (GAIN)	Worldwide	24530	25.8	30.6	Sep-12	Dec-18	Eval	Cat. 2	MDF, 2017
2. Nutrition	7. Nutrit. awareness	GVC FARN Nutrition	Burundi	24122	2.8	2.8	Jun-12	May-17	Eval	Cat. 3	Deboutte, 2016

Objective	Pathway	Project Name	Country	Act. nr	Budget (EUR million)	Expend. 2012-16	Start	End	Eval type*	Eval quality **	Reference
2. Nutrition	7. Nutrit. awareness	Food Security in SCPP (Swisscontact)	Indonesia	24967	1.2	1.2	Nov-12	Dec-16	Eval	Cat. 3	Swisscontact, 2016
2. Nutrition	7. Nutrit. awareness	Improving Child Nutrition (Unicef)	Worldwide	25687	29.5	30.9	Sep-13	Aug-18	MTR	Cat. 4	UNICEF, 2016
3. Busin. env.	8. Land rights	Land Tenure Regularization (DFID)	Rwanda	23214	15.0	9.9	Oct-11	Dec-16	Eval	Cat. 1	Ali et al., 2014, 2015b, 2015a, 2015c, 2016; Santos et al., 2014
3. Busin. env.	8. Land rights	Internatnal Land Coalition	Worldwide	24612	4.2	4.2	Jan-12	Dec-15	Eval	Cat. 3	Zuijderduijn et al., 2015
3. Busin. env.	8. Land rights	Global Land Tool Network	Worldwide	25573	15.5	11.5	Jun-13	Dec-18	MTR	Cat. 2	Brand et al., 2015a
3. Busin. env.	8. Land rights	LAND MANAGEMENT & ADMIN	Mozambique	25686	6.8	7.9	Aug-13	Dec-19	MTR	Cat. 2	Christoplos et al., 2016
3. Busin. env.	9. Infra-structure	Pistes rurales	Benin	24630	5.3	5.3	Oct-12	Dec-15	Eval	Cat. 3	Durero et al., 2015
3. Busin. env.	9. Infra-structure	Loc Demand Driven Invest Proj (LODA)	Rwanda	25542	37.0	35.3	Aug-13	Dec-17	Eval	Cat. 4	CDP, 2016
3. Busin. env.	9. Infra-structure	LWRM Program	Palestinian Terr.	25565	7.7	7.9	Jul-13	Jun-18	MTR	Cat. 3	Brand et al., 2015b
3. Busin. env.	10. Farmer organisation	Agriterra	Worldwide	22861	53.6	38.6	Jan-11	Dec-16	Eval	Cat. 4	KIT, 2015
3. Busin. env.	10. Farmer organisation	Agribusiness initiative dairy	Uganda	23615	6.5	6.5	Oct-12	Dec-16	IOB	Cat. 1	AIID-PwC, 2017b
3. Busin. env.	10. Farmer organisation	Linking Farmers to Markets	Rwanda	24730	5.2	3.6	Dec-12	Dec-17	MTR	Cat. 4	MDF, 2015

Objective	Pathway	Project Name	Country	Act. nr	Budget (EUR million)	Expend. 2012-16	Start	End	Eval type*	Eval quality **	Reference
3. Busin. env.	10. Farmer organisation	Cooperatives Support Program (Spark)	Rwanda	25454	2.0	2.1	May-13	May-17	MTR	Cat. 3	Friends Consultant LTD, 2015
3. Busin. env.	11. Policy dialogue	PASIC (IITA)	Uganda	23620	4.0	2.7	Oct-13	Dec-18	MTR	Cat. 4	Bakema and Drazu, 2015
3. Busin. env.	11. Policy dialogue	CAADP - MDTF (WB)	Regional Africa	24567	2.6	2.6	Jan-12	Jun-17	Eval	Cat. 3	Gerrard et al., 2016

** Type of evaluation: MTR = mid-term review, Eval = evaluation, IOB = IOB impact study.*

*** Quality of evaluation: category 1 is best, see Chapter 2.*

Annex 4 List of projects funded from the food security budget[120]

Objective	Pathway	Act nr.	Project name	Implementor	Country	Start	End	Budget EUR million	Expend. 2012-2016
1. Ag.Prod.	1. Agr. Research	19868	Contribution ICARDA	ICARDA	Worldwide	jul-09	dec-15	6,3	2,5
1. Ag.Prod.	1. Agr. Research	22482	CASCAPE	WUR	Ethiopia	dec-10	jun-16	12,0	10,9
1. Ag.Prod.	1. Agr. Research	24392	Contribution CGIAR	World Bank	Worldwide	jan-12	dec-16	124,7	150,0
1. Ag.Prod.	1. Agr. Research	24426	SOW-VU 2012-2013	SOW-VU	Worldwide	apr-12	dec-14	0,8	0,8
1. Ag.Prod.	1. Agr. Research	24565	FARA	Forum Ag. Research Africa	Worldwide	jan-12	dec-15	1,1	1,1
1. Ag.Prod.	1. Agr. Research	25172	Food & Business Fund	NWO	Worldwide	jan-13	dec-18	15,0	6,4
1. Ag.Prod.	1. Agr. Research	25431	Global Food Challenges	NWO	Worldwide	jan-13	dec-19	11,0	3,1
1. Ag.Prod.	1. Agr. Research	28161	BENEFIT	WUR	Ethiopia	dec-15	dec-20	30,0	6,7
1. Ag.Prod.	2. Farmer training	23253	AGP 1	WORLD BANK	Ethiopia	sep-11	dec-15	30,0	24,0
1. Ag.Prod.	2. Farmer training	24757	Gaza Buffer Zone	FAO	Palestinian Terr.	okt-12	okt-14	0,3	0,4
1. Ag.Prod.	2. Farmer training	24941	FUPRO Recherche	Fed. of Producers Union	Benin	nov-12	jun-17	1,4	1,3
1. Ag.Prod.	2. Farmer training	24985	High Value Crops	FAO	Palestinian Terr.	dec-12	jun-18	7,1	7,4
1. Ag.Prod.	2. Farmer training	25329	The Hunger Project	The Hunger Project	Benin	mrt-13	jun-17	2,2	2,1
1. Ag.Prod.	2. Farmer training	25550	CABI Plantwise	CABI	Worldwide	jan-13	dec-17	5,0	5,0
1. Ag.Prod.	2. Farmer training	27130	DairyBiss	WUR	Ethiopia	mrt-15	feb-19	1,3	0,6
1. Ag.Prod.	2. Farmer training	28033	AGP 2	WORLD BANK	Ethiopia	dec-15	dec-20	20,0	5,0
1. Ag.Prod.	3. Value chain dev.	14423	Stratigic Alliance for Agr. Dev. In Africa	IFDC	Regional Africa	jan-06	dec-13	16,0	0,8
1. Ag.Prod.	3. Value chain dev.	18162	IDH	MVO	Worldwide	jul-08	dec-16	67,6	34,0
1. Ag.Prod.	3. Value chain dev.	18429	Establishment of Commodity Business Support Centers	Solidaridad	Worldwide	dec-08	dec-13	4,8	1,0

[120] In total 249 projects were funded from the food security budget in the period 2012-2016. This list is restricted by: (i) budget >EUR 100.000; (ii) project doc available; (iii) fits under one of the three food security policy objectives; this selection covers 191 projects, EUR 1.494 million (2012-2016), 98% of total expenditure.

Objective	Pathway	Act nr.	Project name	Implementor	Country	Start	End	Budget EUR million	Expend. 2012-2016
1. Ag.Prod.	3. Value chain dev.	18768	Quinua and Grape-Wine-Singani	Fundación AUTAPO	Bolivia	nov-08	sep-14	18,4	8,1
1. Ag.Prod.	3. Value chain dev.	20359	Innovative rural production	Fundación PROINPA	Bolivia	okt-09	mrt-15	4,2	1,4
1. Ag.Prod.	3. Value chain dev.	20773	Potato-Maize Value Chain	FAO	Nicaragua	nov-09	jun-16	2,9	1,2
1. Ag.Prod.	3. Value chain dev.	22735	Agri business in Africa	IFDC	Worldwide	jan-11	dec-13	5,0	1,2
1. Ag.Prod.	3. Value chain dev.	22970	Dairy Development Program	WUR	Ethiopia	jun-11	dec-14	0,5	0,1
1. Ag.Prod.	3. Value chain dev.	23131	Horticulture value chain	Solidaridad (East, Cen. Afr.)	Kenya	aug-11	dec-15	4,2	3,4
1. Ag.Prod.	3. Value chain dev.	23132	WUR Seed Potato Project	WUR	Kenya	aug-11	aug-16	1,9	1,1
1. Ag.Prod.	3. Value chain dev.	23207	Cocoa_Abrabopa III	Cocoa Abrabopa Association	Ghana	jan-11	dec-16	1,5	1,5
1. Ag.Prod.	3. Value chain dev.	23294	GAFSP	IFC	Regional Africa	okt-11	dec-22	104,3	97,7
1. Ag.Prod.	3. Value chain dev.	23342	Sustainable Palm Oil	Solidaridad West Africa	Ghana	jan-12	dec-16	12,1	11,5
1. Ag.Prod.	3. Value chain dev.	23447	Beira Ag. Growth Corridor	AgDevCo	Mozambique	nov-11	dec-16	8,2	5,0
1. Ag.Prod.	3. Value chain dev.	23448	Integrated Seed Sector Dev.	WUR	Ethiopia	dec-11	jun-16	10,2	6,8
1. Ag.Prod.	3. Value chain dev.	23578	2SCALE	IFDC	Regional Africa	apr-12	mrt-17	42,0	34,7
1. Ag.Prod.	3. Value chain dev.	23616	Catalist-Uganda	IFDC	Uganda	jun-12	nov-17	15,0	14,2
1. Ag.Prod.	3. Value chain dev.	23617	Seed development	DLO / WUR	Uganda	jun-12	mei-17	5,2	4,6
1. Ag.Prod.	3. Value chain dev.	23877	PPP FDOV	RVO	Worldwide	jan-12	dec-22	81,5	38,6
1. Ag.Prod.	3. Value chain dev.	23998	Markets Assistance Program	Kenya Gatsby Trust	Kenya	jul-12	jun-16	3,7	3,4
1. Ag.Prod.	3. Value chain dev.	24073	Kenya Market Dairy Program	SNV	Kenya	mei-12	feb-18	5,5	5,2
1. Ag.Prod.	3. Value chain dev.	24552	SaFaL Food Security	Solidaridad Asia	Bangladesh	nov-12	mei-17	12,0	13,0
1. Ag.Prod.	3. Value chain dev.	24720	Catalist Ii	IFDC	Great Lakes Reg.	apr-12	dec-16	16,6	15,3
1. Ag.Prod.	3. Value chain dev.	24728	Support Seed Multiplication	Technoserve	Mozambique	nov-12	okt-16	3,9	4,4

Objective	Pathway	Act nr.	Project name	Implementor	Country	Start	End	Budget EUR million	Expend. 2012-2016
1. Ag.Prod.	3. Value chain dev.	24759	Support Prog. PNSEB	IFDC	Burundi	nov-12	nov-15	4,1	4,0
1. Ag.Prod.	3. Value chain dev.	24965	Veg-IMPACT	WUR	Indonesia	dec-12	dec-17	4,5	4,4
1. Ag.Prod.	3. Value chain dev.	25032	ASPIRE	SNV	Ethiopia	dec-12	jun-18	6,6	6,1
1. Ag.Prod.	3. Value chain dev.	25061	EDGET - SNV	SNV	Ethiopia	dec-12	jun-18	9,0	8,2
1. Ag.Prod.	3. Value chain dev.	25233	Contrib. 2013 Fonds Commun PNSEB	Min. des Finances	Burundi	apr-13	mrt-16	8,0	8,0
1. Ag.Prod.	3. Value chain dev.	25367	Seeds Sector Dev Prog.	AGRA	South Sudan	nov-13	dec-17	8,3	1,9
1. Ag.Prod.	3. Value chain dev.	25468	Mabang Megakarya Selection Programme	Ghana Cocoa Board	Ghana	jul-13	dec-17	1,1	0,3
1. Ag.Prod.	3. Value chain dev.	25477	PROOFS (markets for the BoP)	ICCO	Bangladesh	jul-13	jun-17	10,0	9,0
1. Ag.Prod.	3. Value chain dev.	25484	G4AW Facility	RVO	Worldwide	mei-13	dec-20	45,2	19,6
1. Ag.Prod.	3. Value chain dev.	25574	Cocoa Rehabilitation and Intensification Programme	Solidaridad West Africa	Ghana	okt-13	okt-17	7,0	6,7
1. Ag.Prod.	3. Value chain dev.	25718	Fisheries and Aquaculture	DLO / WUR	Indonesia	aug-13	okt-17	4,5	3,6
1. Ag.Prod.	3. Value chain dev.	25795	GhanaVeg	WUR	Ghana	nov-13	dec-18	4,0	2,6
1. Ag.Prod.	3. Value chain dev.	25921	Foodsec. Poultry & Dairy	WUR	Indonesia	nov-13	jun-18	4,3	3,9
1. Ag.Prod.	3. Value chain dev.	26412	ISSD Burundi	IFDC	Burundi	sep-14	nov-18	5,0	2,6
1. Ag.Prod.	3. Value chain dev.	26795	Support to BAGC	BAGC	Mozambique	aug-14	dec-16	1,9	1,2
1. Ag.Prod.	3. Value chain dev.	26961	Solar For Farms	SolarNow Services Ltd.	Uganda	nov-14	dec-19	5,0	1,1
1. Ag.Prod.	3. Value chain dev.	27179	HortIMPACT	SNV	Kenya	dec-14	mrt-20	6,7	3,1
1. Ag.Prod.	3. Value chain dev.	27523	Jatrophe II	IITA	Benin	mei-15	dec-20	1,0	0,3
1. Ag.Prod.	3. Value chain dev.	27741	PAPA	IFDC	Burundi	nov-15	dec-19	30,8	9,7
1. Ag.Prod.	3. Value chain dev.	27771	Krishi Utsho	CARE	Bangladesh	nov-15	dec-18	1,0	0,6
1. Ag.Prod.	3. Value chain dev.	28028	The Inclusive Dairy Enterprise	SNV	Uganda	sep-15	dec-20	9,5	3,1
1. Ag.Prod.	3. Value chain dev.	28039	Food Security Gambella ZOA	ZOA	Ethiopia	dec-15	jun-19	1,0	0,3

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1. Ag.Prod.	3. Value chain dev.	28055	Kenya Market-led Aquaculture	Farm Africa	Kenya	dec-15	dec-20	4,2	1,3
1. Ag.Prod.	3. Value chain dev.	28056	3R Kenya	WUR	Kenya	dec-15	dec-20	4,0	1,3
1. Ag.Prod.	3. Value chain dev.	28210	Resilience building in Ethiopia	European Commission	Ethiopia	dec-15	dec-19	9,0	3,0
1. Ag.Prod.	3. Value chain dev.	29342	REACH	IFDC	Uganda	okt-16	mrt-21	10,8	1,2
1. Ag.Prod.	3. Value chain dev.	29417	ISSD Plus	WUR	Uganda	okt-16	jun-21	11,0	1,7
1. Ag.Prod.	4. Nat. resource mgt.	14420	Bale Mountain	Farm Africa	Ethiopia	jun-06	dec-14	2,0	0,5
1. Ag.Prod.	4. Nat. resource mgt.	16806	Labour intens dev marshland2	Helpage Rwanda	Rwanda	okt-07	jun-14	20,1	2,0
1. Ag.Prod.	4. Nat. resource mgt.	19900	Forestry program	Fundacion Puma	Bolivia	aug-09	dec-16	6,0	1,5
1. Ag.Prod.	4. Nat. resource mgt.	22428	Center for Genetic Resources	WUR	Ethiopia	dec-10	dec-15	0,4	0,2
1. Ag.Prod.	4. Nat. resource mgt.	24406	Gambella R.V. Landscapes	Addis Abeba University	Ethiopia	jul-12	dec-15	10,2	10,2
1. Ag.Prod.	4. Nat. resource mgt.	24610	Global Crop Div. Trust	GCDT	Worldwide	jan-12	dec-13	1,8	1,8
1. Ag.Prod.	4. Nat. resource mgt.	24659	ASAP	IFAD	Worldwide	nov-12	okt-16	40,0	40,0
1. Ag.Prod.	4. Nat. resource mgt.	25059	Intro rice cultiv marshlands	WHH	Rwanda	dec-12	dec-15	1,4	1,4
1. Ag.Prod.	4. Nat. resource mgt.	27984	Genetic Resources Policy 2	Bioversity Int.	Worldwide	jan-15	dec-16	1,1	1,1
1. Ag.Prod.	Multi-purpose	21817	Contribution IFAD-8	IFAD	Worldwide	jan-10	dec-13	55,4	17,5
1. Ag.Prod.	Multi-purpose	23857	Seed development project	IFAD	South Sudan	mei-09	dec-16	5,0	5,0
1. Ag.Prod.	Multi-purpose	24431	Contribution IFAD-9	IFAD	Worldwide	aug-12	dec-15	58,0	57,5
1. Ag.Prod.	Multi-purpose	24658	Zambezi Valley Agency	Min. of Plan and Dev.	Mozambique	nov-12	dec-18	15,5	17,2
1. Ag.Prod.	Multi-Purpose	24769	ICCO Food Security & RE Fund	ICCO	Ethiopia	sep-12	dec-16	6,6	6,3
1. Ag.Prod.	Multi-purpose	25673	Agri-sector dev. facility	ICCO	Rwanda	jul-13	dec-16	2,0	2,0
1. Ag.Prod.	Multi-purpose	25774	Dutch Trust Fund Commodity Partnership	Common Fund for Commodities	Regional Africa	aug-13	dec-21	4,3	3,7
1. Ag.Prod.	Multi-purpose	27689	Contribution IFAD	IFAD	Worldwide	aug-15	dec-19	69,0	23,0

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2. Nutrition	5. Social safety net	20128	FOB fase III	Stg. Fonds Ontwikkeling Binnenland	Suriname	jun-09	dec-15	3,5	0,4
2. Nutrition	5. Social safety net	20775	PSNP Fase 3	IBRD	Ethiopia	nov-09	dec-21	74,0	45,7
2. Nutrition	5. Social safety net	24265	Food Security - Inner Delta	CARE International	Mali	jun-12	dec-14	1,8	1,8
2. Nutrition	5. Social safety net	24316	Food security – Agricultural Emergency Programme	Sasakawa Global 2000	Mali	jun-12	dec-13	1,7	1,7
2. Nutrition	5. Social safety net	24386	Food Security Tombouctou	Red Cross	Mali	jul-12	dec-14	0,3	0,3
2. Nutrition	5. Social safety net	24398	INAS II	MINEC	Mozambique	nov-12	dec-17	8,1	3,8
2. Nutrition	5. Social safety net	24881	Gen. Vulnerability, Food Security, Nutrition Analysis	WFP	Benin	nov-12	dec-15	0,2	0,2
2. Nutrition	5. Social safety net	25252	Fonds de Stabilisation Econ.	UNDP	Mali	mrt-13	dec-16	4,0	4,0
2. Nutrition	5. Social safety net	25672	School Feeding NW Burundi	WFP	Burundi	aug-13	jul-18	7,9	7,9
2. Nutrition	5. Social safety net	25752	Social Accountability	Helpage International.	Mozambique	sep-13	aug-17	0,8	0,8
2. Nutrition	5. Social safety net	25812	Participatory Forest Mgt	Rw. Nat. Resource Authority	Rwanda	jul-13	mei-17	7,5	6,8
2. Nutrition	5. Social safety net	26869	Urgence Aliment Bétail 2014	MAECI	Mali	okt-14	dec-15	1,0	1,0
2. Nutrition	5. Social safety net	28727	Promotion du develop.	WFP	Burundi	apr-16	dec-19	18,1	9,8
2. Nutrition	6. Food fortification	19299	GAIN Schokland	GAIN	Worldwide	feb-09	dec-15	6,5	1,5
2. Nutrition	6. Food fortification	24411	Flour Fortification Initiative Scaling up Smarter Futures	Int. Fed. f Spino Bifida and Hydrocephalus	Worldwide	jul-12	dec-19	1,5	1,3
2. Nutrition	6. Food fortification	24530	Driving Nutrition Impact	GAIN	Worldwide	sep-12	dec-18	25,8	30,6
2. Nutrition	7. Nutrit. awareness	23141	Community Based Nutrition	UNICEF	Ethiopia	sep-11	jun-17	4,0	3,8
2. Nutrition	7. Nutrit. awareness	24122	GVC FARN Nutrition	GVC (Civil voluntary group)	Burundi	jun-12	mei-17	2,8	2,8
2. Nutrition	7. Nutrit. awareness	24388	Scaling Up Nutrition	UNDP	Worldwide	jul-12	dec-15	1,0	1,0
2. Nutrition	7. Nutrit. awareness	24967	Food Security in Sustainable Cocoa Production Program	Swisscontact	Indonesia	nov-12	dec-16	1,2	1,2

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2. Nutrition	7. Nutrit. awareness	25457	Food access for young children	UNICEF	Rwanda	jun-13	dec-17	14,3	14,5
2. Nutrition	7. Nutrit. awareness	25687	Improving Child Nutrition	UNICEF	Worldwide	sep-13	aug-18	29,5	30,9
2. Nutrition	7. Nutrit. awareness	25747	Food & Nutrition	Business Watch Indonesia	Indonesia	sep-13	dec-15	1,0	1,0
3. Busin. env.	10. Farmer organisation	22861	Producer org. 2011-2015	Agriterra	Worldwide	jan-11	dec-16	53,6	38,6
3. Busin. env.	10. Farmer organisation	23615	Agribusiness initiative (dairy)	Royal Danish Embassy	Uganda	okt-12	dec-16	6,5	6,5
3. Busin. env.	10. Farmer organisation	24730	Linking Farmers to Markets	Private Sector Fed.	Rwanda	dec-12	dec-17	5,2	3,6
3. Busin. env.	10. Farmer organisation	25454	Coop Support Program	Stichting SPARK	Rwanda	mei-13	mei-17	2,0	2,1
3. Busin. env.	10. Farmer organisation	25864	Farmers Fighting Poverty	AgriCord	Regional Africa	jul-13	dec-18	16,0	11,0
3. Busin. env.	11. Policy dialogue	18890	AgriProFocus 2009 - 2012	AgroProFocus	Worldwide	dec-08	dec-14	2,7	1,3
3. Busin. env.	11. Policy dialogue	22476	EHPEA	EHPEA	Ethiopia	dec-10	dec-14	2,0	0,9
3. Busin. env.	11. Policy dialogue	23620	PASIC Policy Agro-Intensification	IITA	Uganda	okt-13	dec-18	4,0	2,7
3. Busin. env.	11. Policy dialogue	24373	AgriProFocus 2012	AgriProFocus	Worldwide	jan-12	dec-14	1,2	1,2
3. Busin. env.	11. Policy dialogue	24567	CAADP - MDTF	World Bank	Regional Africa	jan-12	jun-17	2,6	2,6
3. Busin. env.	11. Policy dialogue	24597	Future of standards	IFC	Worldwide	sep-12	mrt-15	0,4	0,4
3. Busin. env.	11. Policy dialogue	24975	ECDPM 2013-2016	ECDPM	Worldwide	jan-13	dec-17	12,3	11,8
3. Busin. env.	11. Policy dialogue	25427	ED-HDP EHPEA	EHPEA	Ethiopia	mei-13	dec-19	10,3	5,6
3. Busin. env.	11. Policy dialogue	25467	Office Food & Business Forum	AgriProFocus	Worldwide	jan-13	dec-16	6,1	3,9
3. Busin. env.	11. Policy dialogue	25689	WEF New Vision for Agric.	World Economic Forum	Worldwide	sep-13	aug-17	0,8	0,8
3. Busin. env.	11. Policy dialogue	26021	AgriProFocus 2013-2017	AgriProFocus	Worldwide	jul-13	jun-18	10,0	9,5

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3. Busin. env.	11. Policy dialogue	26406	Contribution FAO 2014-2015	FAO	Worldwide	jan-14	dec-18	5,0	5,0
3. Busin. env.	11. Policy dialogue	28714	Global Init. Food Sec. & Agr.	World Economic Forum	Worldwide	sep-15	aug-18	1,4	1,3
3. Busin. env.	11. Policy dialogue	28716	Gender in Value Chains	AgriProFocus	Worldwide	okt-15	dec-18	0,5	0,2
3. Busin. env.	11. Policy dialogue	29058	Contribution FAO 2016 - 2017	FAO	Worldwide	jan-16	dec-18	5,0	2,5
3. Busin. env.	8. Land rights	21952	National Land Reform Plan II	INRA Nat. Inst. Agr. Reform	Bolivia	aug-10	dec-14	7,1	3,0
3. Busin. env.	8. Land rights	23214	Land Tenure Regularization	DFID	Rwanda	okt-11	dec-16	15,0	9,9
3. Busin. env.	8. Land rights	23885	Comm. Land Use Fund ph. 2	DFID	Mozambique	apr-12	dec-15	0,3	0,3
3. Busin. env.	8. Land rights	24018	Land Tenure Security	ORAM Rural Org. Mutual Aid	Mozambique	apr-12	dec-15	0,8	0,8
3. Busin. env.	8. Land rights	24612	International Land Coalition	ILC	Worldwide	jan-12	dec-15	4,2	4,2
3. Busin. env.	8. Land rights	25573	Global Land Tool Network	IFAD	Worldwide	jun-13	dec-18	15,5	11,5
3. Busin. env.	8. Land rights	25686	Land Mgt & Admin	Min of Agriculture	Mozambique	aug-13	dec-19	6,8	7,9
3. Busin. env.	8. Land rights	25799	Land certification	ZOA	Burundi	dec-13	nov-17	3,0	2,5
3. Busin. env.	8. Land rights	25826	UCF Foncier Institutionnel	Unité de Coordination de la Formulation	Benin	nov-13	dec-15	1,4	1,1
3. Busin. env.	8. Land rights	27008	Projet Foncier Local	VNG International	Benin	okt-14	aug-19	4,4	2,5
3. Busin. env.	8. Land rights	27009	Land Foundation	CTC-COOP (com. land coop)	Mozambique	dec-14	dec-18	3,5	4,3
3. Busin. env.	8. Land rights	27620	Land Kadaster Partnership	Kadaster	Worldwide	apr-15	dec-20	0,9	0,4
3. Busin. env.	8. Land rights	27644	Securing Land Rights phase II	Rw. Init. for Sust. Dev.	Rwanda	jul-15	dec-19	1,0	0,6
3. Busin. env.	8. Land rights	27962	ISA Land Governance	Universiteit Utrecht	Worldwide	aug-15	dec-17	0,6	0,6
3. Busin. env.	8. Land rights	29044	Implementation Strategy	ILC	Worldwide	jan-16	dec-19	2,8	0,9
3. Busin. env.	8. Land rights	29131	Land Academy 2	Universiteit Utrecht	Worldwide	jul-16	jun-22	1,7	0,2

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3. Busin. env.	9. Infrastructure	23530	Rural Fund	Rabobank	Worldwide	mrt-11	dec-13	0,6	0,3
3. Busin. env.	9. Infrastructure	23743	Feeder roads consolidation	Helpage Rwanda	Rwanda	jan-12	mrt-15	10,0	9,9
3. Busin. env.	9. Infrastructure	24371	District Investments – Rw Loc. Dev. Sup. Fund.	LODA	Rwanda	jul-12	jun-14	5,7	5,7
3. Busin. env.	9. Infrastructure	24630	Rural roads 2012-2013	Royal Danish Embassy	Benin	okt-12	dec-15	5,3	5,3
3. Busin. env.	9. Infrastructure	24723	Feeder road construction	WFP	South Sudan	nov-12	jun-16	16,9	12,5
3. Busin. env.	9. Infrastructure	24969	NEAFSEEP	Financial Access Consulting Services	Kenya	nov-12	dec-14	0,3	0,3
3. Busin. env.	9. Infrastructure	25452	Agri-Finance Terrafina	ICCO	Burundi	okt-14	okt-18	7,9	3,1
3. Busin. env.	9. Infrastructure	25491	Improve Market Access	Min. of Finance & Econ Plan.	Rwanda	dec-13	dec-18	10,2	8,1
3. Busin. env.	9. Infrastructure	25542	Local Demand Driven Investment Project	LODA	Rwanda	aug-13	dec-17	37,0	35,3
3. Busin. env.	9. Infrastructure	25565	Land and Water Resource Mgt. Program	Union Of Agricultural Work Com.	Palestinian Terr.	jul-13	jun-18	7,7	7,9
3. Busin. env.	9. Infrastructure	25627	Port Cotonou Quai Survey	Amsterdam Port Consultants	Benin	jul-13	dec-15	0,2	0,2
3. Busin. env.	9. Infrastructure	25882	Financial Inclusion	DFCU Bank	Uganda	nov-13	dec-19	5,5	2,9
3. Busin. env.	9. Infrastructure	25978	Electricity Access Program 2	Min of Finance Econ. Plan.	Rwanda	dec-13	jun-15	4,0	3,9
3. Busin. env.	9. Infrastructure	26197	Rural roads II 2014/16	Min de l'Economie et des Finances	Benin	jan-14	aug-17	20,0	17,2
3. Busin. env.	9. Infrastructure	26389	Small Scale Micro Irrigation Support Project	Agriteam Canada Consulting	Ethiopia	nov-14	nov-19	10,0	6,0
3. Busin. env.	9. Infrastructure	26416	Area C Agricultural Wells	FAO	Palestinian Terr.	mei-14	apr-17	1,9	2,0
3. Busin. env.	9. Infrastructure	26928	Electricity Access Rollout Pr.	Rwanda Energy Group	Rwanda	okt-14	sep-16	5,0	4,8
3. Busin. env.	9. Infrastructure	27140	Apex for Rural Financing	Rabobank	Ethiopia	dec-14	feb-16	0,1	0,1
3. Busin. env.	9. Infrastructure	29388	Local Economic Dev.	LODA	Rwanda	jul-16	sep-21	30,5	10,0

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3. Busin. env.	cap dev private sector	17369	Development & entrepreneurship	Fundación Nuevo Norte	Bolivia	jan-08	dec-14	3,7	0,4
3. Busin. env.	cap dev private sector	23893	Business Support Facility	WUR	Ethiopia	jan-12	dec-15	0,2	0,2
3. Busin. env.	cap dev private sector	24064	Agrbusiness Dev Prog	Euroconsult Mott McDonald	South Sudan	mei-12	dec-18	11,3	4,4
3. Busin. env.	cap dev private sector	25015	Auto. Sup. Sys. Import of Phytosanitary Consignments	Kenya Plant Health Inspectorate Service	Kenya	nov-12	dec-15	0,7	0,7
3. Busin. env.	cap dev private sector	25066	Agri Business Support Facility	Addis Ababa Chamber Of Commerce	Ethiopia	dec-12	jun-16	2,8	2,1
3. Busin. env.	cap dev private sector	25235	Approche Communale	IFDC	Benin	feb-13	dec-18	10,2	6,5
3. Busin. env.	cap dev private sector	25558	Agrobusiness	SNV	Benin	jul-13	dec-17	3,9	3,0
3. Busin. env.	cap dev private sector	25927	Agribusiness Incubation Net.	Spark	Burundi	dec-13	dec-17	2,3	1,2
3. Busin. env.	cap dev public sector	17215	Support of CDF	Communal Dev. Fund	Rwanda	dec-07	dec-14	17,6	0,2
3. Busin. env.	cap dev public sector	23619	TMEA-Uganda	Trademark East Africa	Uganda	mei-12	jun-17	7,4	7,1
3. Busin. env.	cap dev public sector	24235	Food Safety	FAO	Bangladesh	jul-12	dec-18	11,8	10,4
3. Busin. env.	cap dev public sector	24599	ATA	Agr. Transformation Agency	Ethiopia	jul-12	jul-17	8,3	9,7
3. Busin. env.	cap dev public sector	24712	Enquete Nat. Agr. Bur.	Belgian Dev. Agency	Burundi	feb-13	apr-15	0,3	0,3
3. Busin. env.	cap dev public sector	24871	Cap. Building Food Security	Public Sector Capacity Building Secretariat	Rwanda	dec-12	nov-17	5,2	4,5
3. Busin. env.	cap dev public sector	25638	Business of Agriculture	IBRD	Worldwide	jul-13	jun-17	1,2	1,2
3. Busin. env.	cap dev public sector	25855	SPS Capacity Building MoA	FAO	Palestinian Terr.	nov-13	dec-17	1,0	0,9

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3. Busin. env.	cap dev public sector	28735	ATA 2	Agr. Transformation Agency	Ethiopia	dec-16	jun-21	8,7	1,1
3. Busin. env.	cap dev public sector	28900	Dev. Agency Group	UNDP	Ethiopia	jan-16	jun-20	0,2	0,0
3. Busin. env.	Edu. and Training	22238	Afr. Agro business Academy	WUR	Regional Africa	nov-10	dec-13	0,4	0,2
3. Busin. env.	Edu. and Training	23618	Agri Skills 4 You	ICCO	Uganda	okt-12	okt-17	9,0	8,5
3. Busin. env.	Edu. and Training	24221	PPP Learn4Work	Edukans	Regional Africa	mei-12	dec-17	6,0	5,3
3. Busin. env.	Edu. and Training	24624	NICHE and NFP for Food Sec.	NUFFIC	Worldwide	apr-13	mrt-22	4,0	4,0
3. Busin. env.	Edu. and Training	24966	FIBANI vocational training	Swisscontact	Mali	nov-12	dec-16	6,5	6,5
3. Busin. env.	Edu. and Training	25044	Food Security – NICHE & NFP	NUFFIC	Worldwide	jan-12	dec-16	102,3	101,0
3. Busin. env.	Edu. and Training	25419	African Agrib. Academy	WUR	Worldwide	jan-13	dec-18	2,0	1,5
3. Busin. env.	Edu. and Training	26673	Int. Prog. Elimin. Child Labour	ILO	Worldwide	jun-14	sep-16	2,0	2,0
3. Busin. env.	Edu. and Training	27840	YEP-Agrofood	Netherl. Water Partnership	Worldwide	jun-15	dec-20	5,0	2,4
3. Busin. env.	Edu. and Training	28052	Youths Employment in Agri	AVSI Int. Serv. Volunteers A.	Uganda	okt-15	dec-21	11,9	2,5
3. Busin. env.	Edu. and Training	28862	StuNed V - Food Security Sect.	NUFFIC	Indonesia	jan-16	dec-20	1,0	0,7

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