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**HILFSWERK INTERNATIONAL: THE ROLE OF AN NGO AT THE INTERFACE
BETWEEN SCIENCE, SOCIETY, AND GOVERNMENT IN CENTRAL ASIA**

**HILFSWERK INTERNATIONAL: РОЛЬ НПО НА СТЫКЕ НАУКИ, ОБЩЕСТВА И
ГОСУДАРСТВА В ЦЕНТРАЛЬНОЙ АЗИИ**

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МАМЛЕКЕТТИН БАЙЛАНЫШЫНДА ӨЭУДАРДЫН РОЛУ**

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HILFSWERK INTERNATIONAL: THE ROLE OF AN NGO AT THE INTERFACE BETWEEN SCIENCE, SOCIETY, AND GOVERNMENT IN CENTRAL ASIA

Аннотация

Relevance. Over the last decades, distinct models, strategies, and funding forms have become available for international projects in various sectors. On the academic plane, and particularly in the fields of environmental science and sustainability, project applicants usually face the choice between purely scientific grants or those dedicated, e.g., to social or business development. Very often and paradoxically, this discrepancy has to be overcome already at the stage of a grant application, as many donors require a clear outline of the expected impact of a respective project reaching out to other sectors of application. In this article, we present the Central Asia Mission of the NGO Hilfswerk International and its essential beneficial role for international project implementation between Europe and Central Asia at the interface between science, society, and governments. Its mode of operation over more than 15 years is outlined by the five consecutive economic development projects CANDY I–V and the thereupon-based Erasmus+ projects HECAFS and AgroDev targeting capacity building in higher education systems. All seven projects had a strong focus on agriculture and food security but exemplarily stand for Hilfswerk International's flexible expertise adjustable to other crucial thematics of the near future – i.e., climate change, environmental pollution, water security, etc.

Keywords: NGO, agricultural development, food security and standardization, SME support, higher education development, capacity building, sustainability.

Hilfswerk International: роль НПО на стыке науки, общества и государства в Центральной Азии

*Hilfswerk International: борбордук Азиядагы илим, коом, жана мамлекеттин байланышында
ӨЭУдардын ролу*

Аннотация

Актуальность. За последние десятилетия для международных проектов в различных секторах стали доступны различные модели, стратегии и формы финансирования. В академическом плане, и особенно в области наук об окружающей среде и устойчивом развитии, заявители проектов обычно сталкиваются с выбором между чисто научными грантами или грантами, посвященными, например, социальному или бизнес-развитию. Очень часто и как это ни парадоксально, это несоответствие приходится преодолевать уже на этапе подачи заявки на грант, поскольку многие доноры требуют четкого описания ожидаемого воздействия соответствующего проекта на другие отрасли и сферы. В этой статье мы представляем Центральноазиатскую миссию НПО Hilfswerk International и ее важную благотворную роль в реализации международных проектов между Европейским Союзом и Центральной Азией на стыке науки, общества и правительств. Режим деятельности Hilfswerk International на протяжении более 15 лет очерчен пятью последовательными проектами экономического развития CANDY I–V и основанными на них проектами Erasmus+ HECAFS и AgroDev, направленными на наращивание потенциала в системах высшего образования. Все семь проектов были сосредоточены на сельском хозяйстве и продовольственной безопасности, но образцово демонстрируют гибкий опыт Hilfswerk International, который можно адаптировать к другим важным темам ближайшего будущего, например, изменению климата, загрязнению окружающей

Аннотация

Маанилүүлүк. Акыркы он жылдыктарда ар кандай секторлордогу эл аралык долбоорлор үчүн каржылоонун ар кандай моделдери, стратегиялары жана формалары жеткиликтүү болуп калды. Академиялык терминдер менен айтканда, өзгөчө экологиялык жана туруктуулук илимдери жаатында, долбоордун талапкерлери, адатта, социалдык же бизнести өнүктүрүүгө багытталган илимий гранттардын же гранттардын ортосунда тандоого туш болушат. Көп учурда жана парадоксалдуу түрдө, бул карама-каршылык гранттык өтүнмөнүн этабында жоюлууга туура келет, анткени көптөгөн донорлор тиешелүү долбоордун башка секторлорго жана аймактарга күтүлгөн таасирин так сүрөттөп берүүнү талап кылат. Бул макалада биз Hilfswerk International өкмөттүк эмес уюмунун Борбор Азиядагы миссиясын жана анын илим, коом жана өкмөттөрдүн кесилишинде Европа Биримдиги менен Борбордук Азиянын ортосундагы эл аралык долбоорлорду ишке ашыруудагы маанилүү пайдалуу ролун сунуштайбыз. Hilfswerk International компаниясынын 15 жылдан ашык иштөө режими беш ырааттуу CANDY I–V экономикалык өнүгүү долбоорлору жана алардын негизиндеги HECAFS жана AgroDev Эразмус+ долбоорлору, жогорку билим берүү системаларынын потенциалын жогорулатууга багытталган.

среды, безопасностью водоснабжения и т. д.

Ключевые слова: НПО, развитие сельского хозяйства, продовольственная безопасность и стандартизация, поддержка МСП, развитие высшего образования, наращивание потенциала, устойчивость.

Ачык сөздөр: БӨУлар, айыл чарбаны өнүктүрүү, азык-түлүк коопсуздугу жана стандартташтыруу, чакан жана орто бизнести колдоо, жогорку билим берүүнү өнүктүрүү, потенциалды жогорулатуу, туруктуулук.

Introduction

Hilfswerk International is an Austrian non-governmental organization (NGO) and one of the country's leaders in development cooperation and humanitarian aid, operating since 1978 in a global radius. While the umbrella organization Hilfswerk Österreich (www.hilfswerk.at) assists in the socio-medical sector within Austria, Hilfswerk International (www.hilfswerk.at/international/en) operates on a global scale focusing on long-term economic development initiatives, skill development programs, job creation strategies, general capacity building, but also provides social and medical care and emergency assistance as well as immediate relief campaigns in war- and famine-stricken regions, and regions affected by sustained major economic depression or natural disasters – e.g., after the devastating earthquakes in Turkey and Syria in February 2023 and in Morocco in September 2023.

Until 2023, Hilfswerk International has implemented projects and campaigns in more than 20 countries in Africa, Central Asia, Eastern Europe, Latin America, the Middle East, South and South-East Asia, and South-Eastern Europe; they are financed through dedicated thematic national and international project funds (e.g., from the European Commission (EC), the United Nations High Commissioner for Refugees (UNHCR), the United Nations International Children's Emergency Fund (UNICEF), the Austrian Development Agency, or the United States Agency for International Development (USAID)) as well as private donations, corporate social responsibility and sponsoring. Hilfswerk International is, therefore, a self-sustaining non-profit organization (NPO) whose main objective is to create perspectives and provide sustainable solutions tailored to cultural and social backgrounds on national and regional levels.

It is of particular importance to note that Hilfswerk International acts as an impartial entity and does not engage in political action, nor does it stand for religious or traditional beliefs; all activities are transparently traceable and follow European Union (EU) financial standards as well as requirements from the respective countries of operation. These principles are reflected by the logo of Hilfswerk International, showing two shaking hands representing fairness and equality (Figure 1). The word "Hilfswerk" is of German origin. It is composed of the word "Hilfe", meaning "help", and of the word "Werk", meaning "work".

Being an NGO, Hilfswerk International is not categorized as a scientific, private-sector, or political stakeholder. However, it can act as a mediator between these entities and a driving force for project implementation – a role that is often underestimated, as many stakeholders do not see the necessity and benefits of involving an NGO in multi-partial projects. This article presents the essential role of Hilfswerk International in Central Asia (www.hilfswerk.tj/en) to exemplify the long-lasting success of a consecutive and topic-consistent project series in the field of agriculture and food security.

Mode of operation in Central Asia

Like in all countries of operation, Hilfswerk International adapts its strategies and thematic focus to the local and regional conditions of the respective countries. In Central Asia, the representative office is located in Dushanbe, Tajikistan (Figure 1), but the mission has coordinated activities on an equal basis also in Kyrgyzstan, Uzbekistan, and Kazakhstan since 2001, respecting the main principles of long-lasting sustainability in the targeted sectors represented by project stakeholders. These traditionally include associations and unions mainly from the private business

sector, universities and other higher education research units, consulting services as well as governmental bodies. By their nature, these entities have a unique way of operation, different functions and duties, and often distinct objectives and interests. Here, Hilfswerk International positions itself as a diplomatic mediator to facilitate communication and dialogue, equal objective adjustment compatible with all stakeholders' interests, and, hence, optimize the processes of project application, implementation, and post-project management. Thereby, Hilfswerk International ensures cooperation not only between entities that rather seldom work in close symbiosis in Central Asia (e.g., a university with a consulting service or a governmental body with a local farmers' association), but also between concerned entities in Europe and Central Asia, which brings along the aspect of cultural and language barriers, that are likewise mediated by Hilfswerk International.

Depending on the funding type and the requirements imposed by the donor institution, and thanks to its experience of more than 15 years (Figure 2), Hilfswerk International helps to combine the appropriate partners per project layout from its constantly growing network in Central Asia and Europe (Figure 1). The network groups types of stakeholders in a balanced way, accounting for business associations at 32%, universities at 35%, consulting services at 28%, and governmental bodies at 5%. Numbers show that universities and other higher education research units play a considerable role in partnerships and joint activities, which reflects the contemporary flexibility of Hilfswerk International. While during the initial years, most projects targeted the private sector development and associated livelihood improvement (Figure 2), activities turned towards a more academic approach (i.e., through the projects HECAFS and AgroDev; cf. hereafter) since 2016. The primary motivation for this adaption is the fact that, with growing numbers of environmental issues around the globe (i.e., ecosystem preservation, environmental pollution, climate change, greater societal exposure to natural hazards due to population growth and migration, water scarcity, food security, etc.), donor institutions allocate grants with particular dedication to in-depth research on respective subjects.

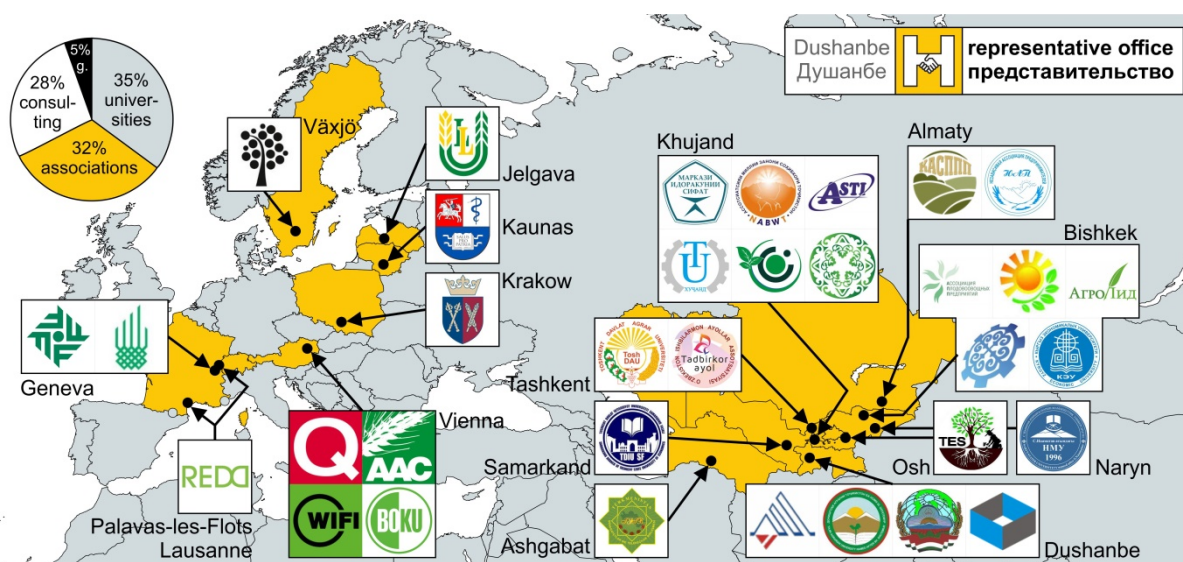


Figure 1. Previous and current partnerships of Hilfswerk International in Central Asia. More than 30 partners in 12 countries cover the sectors of higher education (35%), consulting and training providers (28%), associations representing various communities of interest (32%) and governments (5%).




Figure 2. Timeline of projects implemented by or with the participation of Hilfswerk International in Central Asia. Since 2008, activities in the fields of agriculture, food security, and livelihood improvement, together with the development of higher education systems in the respective branches of sciences, are continuous, i.e., through the project series of CANDY I–V funded by Central Asia Invest (CAI, 2023) and the two Erasmus+ (EC, 2023) projects HECAFS and AgroDev.

Recent focus on agriculture

Especially the southern Central Asian countries of Uzbekistan and Tajikistan, but also Kyrgyzstan and, to some extent, Kazakhstan have a long tradition of agriculture – particularly in fruit, vegetable, and cotton farming (Table 1, Figure 3).

Table 1. Country-specific data related to development status, wealth, and agriculture (Figure 3).

|  | HDI | HDI rank (of 191) | GDP | GDP/capita | land use (for agric.) | arable land | work force 1991–2019 (employed in agric.) | | share of GDP (by agric.) |
|---|------------|-------------------|-------------------|-------------------|--------------------------|-------------------|---|--------------------------|--------------------------|
| | [–] | [–] | [\$] | [mio \$] | [mio ha] | [%] | [%] | [%] | [%] |
| Kazakhstan | 0.811 | 56 | 220 623.0 | 11 243.7 | 214.0 | 11.0 | 36.9 | 14.9 | 5.0 |
| Uzbekistan | 0.727 | 101 | 80 391.9 | 2 255.2 | 25.7 | 9.1 | 40.7 | 25.7 | 25.0 |
| Kyrgyzstan | 0.692 | 118 | 10 930.6 | 1 606.7 | 10.4 | 6.7 | 35.5 | 19.3 | 14.7 |
| Tajikistan | 0.685 | 122 | 10 492.1 | 1 054.2 | 4.9 | 6.0 | 54.0 | 44.7 | 24.0 |
| year of reference | 2021/22 | 2021/22 | 2022 | 2022 | 2020 | 2021 | 1991 | 2019 | 2021 |
| source | UNDP, 2023 | UNDP, 2023 | World Bank, 2023a | World Bank, 2023b | Our World in Data, 2023a | World Bank, 2023c | Our World in Data, 2023b | Our World in Data, 2023b | Our World in Data, 2023c |

In all four countries, arable land (i.e., land that is suitable for crop and livestock farming) covers 6–11% of the national territory; however, shares of the countries' Gross Domestic Product (GDP) attributed to agricultural activities vary significantly between the four countries. Having by far the highest Human Development Index (HDI) in Central Asia, the highest GDP, and the highest GDP per capita, Kazakhstan attributes only 5% of the GDP to agricultural produce. On the other extreme in terms of HDI and GDP, Tajikistan generates 24% of the GDP from agriculture on the smallest relative and absolute arable amount of land and employs by far the highest number of people (i.e., more than 40% of the population) in this sector.

These numbers project an urgent need but also a great potential for development in agriculture and its related fields, such as regional hydrology, climate change, environmental pollution, etc.

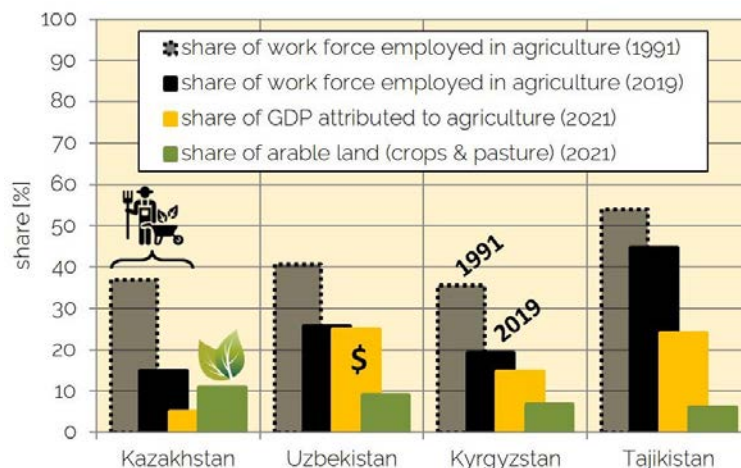


Figure 3. Shares of the work force employed in agriculture in 1991 and 2019 (Our World in Data, 2023b), Gross Domestic Product (GDP) attributed to agriculture in 2021 (Our World in Data, 2023c), and arable land in 2021 (World Bank, 2023c) per country (Table 1).

However, for various reasons, beneficial developments are often hindered or inert in their implementation. One major reason is the young age of the Central Asian countries, which became independent only about three decades ago after the disintegration of the Soviet Union in September 1991. On an economic and resource-related plane, the newly established countries were cut off from their former markets, processing partners, and trade routes, leading to a production drop and forcing them to reorientate and rearrange for new strategies (e.g., Batsaikhan & Dabrowski, 2017; Dowling & Wignaraja, 2006; Pomfret, 2021). One strategy common to all Central Asian countries is the consciousness of their resources and prioritizing their consumption and commercialization for their own benefit, which very often leads to conflicts (e.g., Kurmanalieva, 2018; Lewis, 2008; Toktomushev, 2018). A classic example is the water distribution between the Amu Darya and Syr Darya upstream countries Tajikistan and Kyrgyzstan and the downstream countries Uzbekistan and Kazakhstan. During the Soviet Rule, water distribution was regulated for all four countries. In contrast, today, the poorer countries of Tajikistan and Kyrgyzstan attempt to extend the exploitation of hydropower by damming rivers, which, in return, could lead to water deficits further downstream, impacting agricultural production and many more ecologic aspects (e.g., ICG, 2002; Janusz-Pawletta & Gubaidullina, 2022).

Other reasons hampering beneficial developments (not necessarily intrinsic to Central Asia, though) range from global climate change and its impacts on livelihood and prosperity to culturally, politically and/or religiously motivated differences between groups of the society (e.g., after the Tajik Civil War from 1992 to 1997; e.g., Johns, 2002), epidemics (e.g., malaria outbreaks in Western Tajikistan; Matthys et al. 2008) and pandemics (e.g., COVID-19), low buying power, (youth) unemployment, etc.

Acknowledging these not only difficult but also sensitive matters, Hilfswerk International went along the donor tendency of funding projects with relation to agro-environmental development and food security over the last 15 years, giving room for distinct positions of involved stakeholders reflecting their individual interests, desires, needs, and expectations.

Moreover, and independently of the type of project activity, Hilfswerk International is strictly committed to the 17 Sustainable Development Goals (SDGs; United Nations, 2023) in its global actions. Besides the above-mentioned socio-medical engagement, a strong component of practice

targets environmental and climate-related topics such as ecosystem preservation in the Colombian rain forest or mangrove forests in Mozambique, both part of the most significant oxygen suppliers and, hence, directly impacting our global climate. Also, in Central Asia, Hilfswerk International relates its activities directly or indirectly to climate action and/or climate change coping strategies. The very first of Hilfswerk International's project series from 2004 to 2007 (Figure 2), i.e., the EC Humanitarian Aid Department's "Disaster Preparedness Programme" (DIPECHO; HWI, 2023a), focused on natural hazards in the main disaster-prone regions of the world. In 2011 (Figure 2) followed the project "Poverty Alleviation by Mitigation of Integrated High-mountain Risk" (PAMIR; HWI, 2023b) by the EU's Thematic Program for Environment and Sustainable Management of Natural Resources, including Energy. Notably, the latter stands out in terms of scientific publications and citizen science in Tajikistan, Kyrgyzstan, and Afghanistan.

Today, Hilfswerk International's commitment to climate and environment in Central Asia is reflected by its distribution of partner groups (Figure 1) and their covered SDGs (Figure 4). Particularly, universities and counseling services contribute to climate research, together accounting for about two thirds of the partnerships. By linking partner groups and coordinating their cooperation (i.e., SDG 17), Hilfswerk International plays, thus, an indirect but essential role in climate action and research in Central Asia.

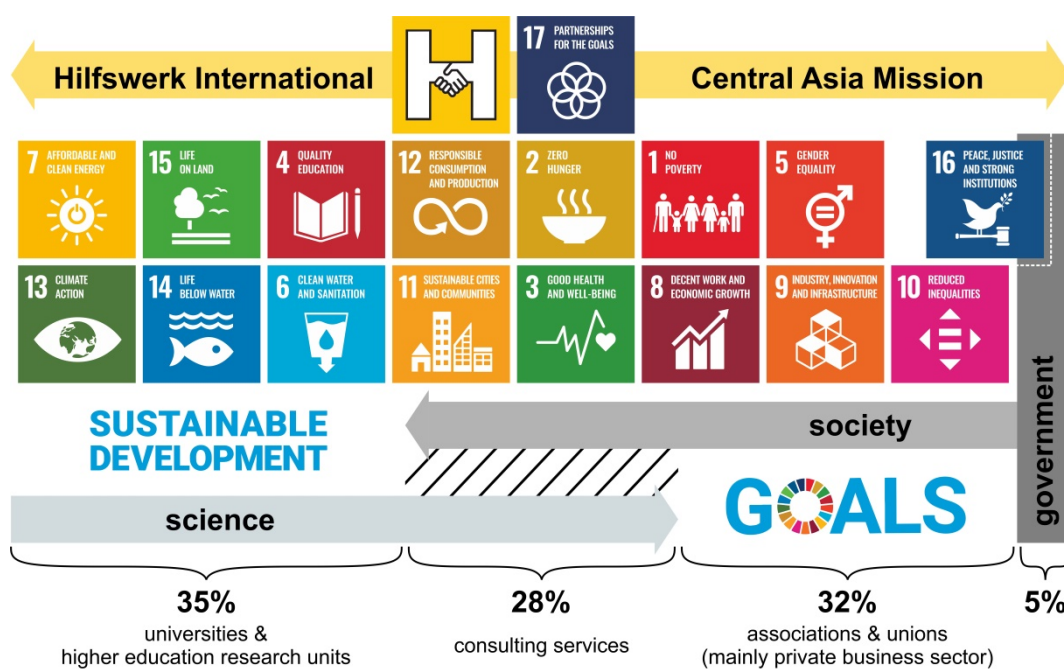


Figure 4. Sustainable Development Goals (SDGs; United Nations, 2023) covered by Hilfswerk International's partner groups (Figure 1).

Success story of CANDY I–V, HECAFS and AgroDev

Since 2008, Hilfswerk International has looked back to a continuous sequence of agriculture-related projects (Figure 2), which all are characterized not only by extraordinary individual success but also show the thematic adaptiveness of Hilfswerk International and its ability to complement project types, (re-)combine partners and adjust to various thematics. After the three business-orientated projects of CANDY I, II, and III (discussed hereafter; Figure 5), Hilfswerk participated for the first time in an academic project (i.e., HECAFS; discussed hereafter; Figure 5) with the most satisfactory results. While continuing the project series of CANDY with CANDY IV and V, a

second academic project (i.e., AgroDev; discussed hereafter; Figure 5) was initiated in 2021, bringing the quota of partnerships with universities and other higher education research units to 35% (Figure 1). This management is noteworthy, as project layouts and conceptions of CANDY I–V are considerably different compared to those of HECAFS and AgroDev; furthermore, they are dedicated to different beneficiaries.

CANDY I–V with Central Asia Invest

CANDY stands for "Central Asian Nuts, Dried Fruit and Honey processing small- and medium-sized enterprises (SMEs)". All five projects were funded by the EU program Central Asia Invest (CAI, 2023), partially co-funded by the Austrian Development Agency, and carry the following titles:

- CANDY I: SME Support for Fruit and Vegetable Processing in Tajikistan (2008–2010; HWI, 2023c)
- CANDY II: Integrated Approach towards Promoting Central Asian Nuts, Dried Fruit and Honey Processing SMEs (2011–2012; HWI, 2023d)
- CANDY III: Economic Development in Central Asia by Promotion of Processing Sector Business Intermediary Organizations (BIOs) and SMEs (2013–2015; HWI, 2023e)
- CANDY IV: Advanced BIO Support Program: Specialized and Comprehensive Services for Export-Oriented SMEs in the Processing Sector (2017–2019; HWI, 2023f)
- CANDY V: Regional Integration and Capacity Building to Boost Competitiveness of MSMEs in Agribusiness and Trade Promotion in Central Asia (2020–2022; HWI, 2023g)

The project series of CANDY I–V stands out against many other initiatives, as Hilfswerk International, together with its partners, managed to consistently follow – over the course of more than 15 years – an integral development cycle of an entire economic sector that was considerably underrepresented in the past. During CANDY I, SMEs producing fruit and vegetables were actively supported by improving farming methods and techniques, introducing new technologies, providing modern infrastructure, and conducting vocational, commercial skill, and marketing expertise training. Particular attention was paid to women's empowerment, as many SMEs are run by women – a fact that, amongst other reasons, is caused by work migration to other countries of the male part of the society in Central Asia (e.g., Abazov, 1999; Khitarishvili, 2016; Raissova, 2020). CANDY II targeted, in the next step, the promotion of fruit and vegetable products, capacity enhancement, and quality assurance of services and produce. Here, Hilfswerk International engaged in the elaboration of adapted GLOBALG.A.P. (Good Agricultural Practice) standards (i.e., internationally recognized standards for agricultural produce; GLOBALG.A.P., 2023), the seven HACCP (Hazard Analysis and Critical Control Points) principles (USFDA, 2023) and the ISO22000 management pillars (ISO, 2018). CANDY III then focused on the active development of the processing sector of export-oriented food-producing SMEs to pave the way for produce integration to international markets thanks to the above-mentioned international standards. In addition, CANDY IV integrated BIOs, strengthening their role as service providers for marketing and export strategies. Finally, CANDY V enhanced the capacities of agro-business BIOs and MSMEs, extending its circle of operation to micro-enterprises (adding an M to the abbreviation SME). Key achievements were commercial quality standards, food safety and traceability, product promotion (including geographical

indications and protected designations of origin; discussed hereafter), cluster development, and interaction and knowledge management between business and academia.

During all project phases, consortia paired with different organizations, such as the German Development Cooperation (GIZ), the United Nations Economic Commission for Europe (UNECE), and the United Nations Development Program (UNDP) to optimize deliverables and their implementation on national and regional levels. An example is the cooperation with GIZ within its project framework "Towards Rural Inclusive Growth and Economic Resilience" (GIZ TRIGGER; GIZ, 2023), which eventually led to the Governmental Resolution No. 566 decreeing the formation of agro-industrial clusters in the country until 2040 (Government of the Republic of Tajikistan, 2020).

Following the principles of open-source (i.e., freely accessible) and transparent documentation, Hilfswerk International and its partners provided dozens of guidelines, manuals, information brochures and booklets, posters, reports, (feasibility) studies, (video) tutorials and short films in English, Russian, Tajik, Kyrgyz, Uzbek, and Kazakh, all of which are accessible via the webpage of the Hilfswerk International in Central Asia.



Figure 5. Logos of the projects "Central Asian Nuts, Dried Fruit and Honey processing small- and medium-sized enterprises (SMEs)" (CANDY I–V; HWI, 2023c–g), "Higher Education for Central Asia Food Systems and Standards" (HECAFS; NASMB, 2023), and "Development of Higher Education Content Aimed to Support Industries for Sustainable Production of Qualitative Agri-Food" (AgroDev; KNAU, 2023).

HECAFS with Erasmus+

The previously underrepresented sector of academia in Hilfswerk International's partner repertoire gained a considerable boost in percentage from 2016 to 2019 with the project "Higher Education for Central Asia Food Systems and Standards" (HECAFS; HWI, 2023h), funded by the Erasmus+ program "Enhancing the Potential of Higher Education" (EPHE) of the EU destined to improve higher education systems in partnerships between EU and non-EU countries. In total, seven universities from five countries participated in HECAFS: the Latvia University of Life Sciences and Technologies in Jelgava (as main applicant), the University of Agriculture in Krakow (Poland), the Lithuanian University of Health Sciences in Kaunas, the Kyrgyz State Technical University and the Kyrgyz Economic University both in Bishkek, the Tajik Agrarian University in Dushanbe, and the Khujand Polytechnic Institute of the Tajik Polytechnic University. In addition, Hilfswerk International integrated the National Association of Small and Medium Businesses (NASMB) of Tajikistan and the Kyrgyz Association of Fruit and Vegetable Enterprises (AFVE) – two partners that stood out for excellent cooperation during the projects of CANDY II and III in the years before.

The overall objective of the project consisted of the integration of international production systems and food processing standards into higher education (NASMB, 2023). Particular emphasis was given to the establishment of close links, dialog, and feedback mechanisms between higher education systems and the food-producing and processing industries of Tajikistan and Kyrgyzstan.

Moreover, it promoted the close cooperation between higher education institutions in Central Asia and the European Union, primarily through developing concepts for improving educational infrastructure, teacher capacity training, and elaboration of class modules for GLOBALG.A.P. standards and HACCP principles today taught in Master courses in the participating universities.

AgroDev with Erasmus+

The second academic project of Hilfswerk International, "Development of Higher Education Content Aimed to Support Industries for Sustainable Production of Qualitative Agri-Food" (AgroDev; HWI, 2023i), started in 2021 and is currently in its finishing phase. Funding was obtained from the Erasmus+ program "Capacity Building in Higher Education" (CBHE; EC, 2023) of the EU, the successor initiative after EPHE, however, dedicated to the same goals regarding the improvement of higher education systems in partnerships between EU and non-EU countries. Because of the previous success with HECAFS, the Latvia University of Life Sciences and Technologies in Jelgava retook the position of the main applicant, and also the University of Agriculture in Krakow (Poland) became a returning partner, pairing with the Linnaeus University in Växjö (Sweden), the Kyrgyz National Agrarian University in Bishkek, the Naryn State University in Naryn (Kyrgyzstan), the Tashkent State Agrarian University and the Samarkand Branch of the Tashkent State University of Economics both in Uzbekistan.

Besides the goal-orientated implementation of the classic CBHE practices like in HECAFS, AgroDev bridges back to the gradually acquired experience of Hilfswerk International during the project series of CANDY I–V, establishing ties between universities and agro-industrial enterprises. Here, the main aim was to sensitize the academic landscape for various needs of the agro-industrial sector in order to improve the training of specialists (i.e., researchers, teachers, etc.) and specialists to-be (i.e., students and generally the younger generation) by high-quality content development according to up-to-date research standards, introduction of adapted pedagogical methods, collaboration with field-relevant industries, mutual knowledge transfer, and the creation of modern study environments in classrooms, laboratories, and libraries. Additionally, the introduction of internationally standardized agricultural practices as well as sustainable agro-business management principles and approaches constituted an essential part of AgroDev, thus increasing primary production and pre-processing effectiveness and competitiveness within the agro-industry sector, and thereby supporting business development, ensuring qualitative food and clean environments, and finally promoting regional and rural development.

Extensive documentation of activities and events is available on the AgroDev project webpage (KNAU, 2023) and the one of Hilfswerk International (HWI, 2023i) complying with the partners' as well as the grant requirements of transparency and traceability of project activities.

Synergy of projects

By running several projects characterized by different layouts, conceptions, and beneficiary dedications, Hilfswerk has demonstrated its thematic adaptability while remaining consistent within a common thematic and overall goal: a holistic and multi-sector approach for the development of agricultural activities in Central Asia involving science, society and governments at equal shares in order to enhance dialog between those entities and optimize results.

One remarkable aspect of Hilfswerk International's efforts is self-sustainability. In all countries of activity, primary attention is paid to establishing structures and procedures that can be sustained in the long term, i.e., even once projects finish and funding is no longer available. One successful example to be cited here is the formation of the Central Asian Working Group (CAWG) as a representation of interests for the entirety of the achievements of the project series of CANDY I–V (CAWG, 2023). As a showcase of trans-border cooperation for common goals, it comprises members of the four countries of Tajikistan, Kyrgyzstan, Uzbekistan, and Kazakhstan and carries on strategies initiated by CANDY I–V.

The newest of the CAWG's undertakings is the branding of agricultural products under the principles of geographical indications (GI), a distinctive sign used to identify a product whose quality, reputation, or other characteristics are related to its geographical origin (WIPO, 2023). To ensure equal representation and benefits, the CAWG chose one product per country (Figure 6): the Asht Dried Apricot from the Sughd Region in Tajikistan, the At-Bashinsky White Honey from the Naryn Region Kyrgyzstan, the Khorezm Melon from the Khorezm Region and the Autonomous Republic of Karakalpakstan in Uzbekistan, and the Almaty Aport Apple from the Alma-Ata Region in Kazakhstan. The branding procedure is currently ongoing, as extensive assessment is required before the final submission to the Global Brand Database of the World Intellectual Property Organization (WIPO) to ensure that the agricultural products are unambiguously identifiable according to their characters and area of production, the latter of which will be made available in the form of CANDY-GIS (discussed hereafter).

CANDY-GIS: A question of perspective

The abbreviation GIS stands for "geographical information system", which provides a digital environment to manage, analyze, and visualize geographic data. Hilfswerk and the CAWG are in the course of setting up a small version of a GIS application to map and outline the areas of production of the four GI-branded products, not only with the aim to complete the submission to the WIPO Global Brand Database but also to provide an easy-to-use tool for local farmers who would like to verify their geographic eligibility to brand their products with the respective GI. CANDY-GIS is hosted on the webpage of the Hilfswerk International in Central Asia (Figure 6). Instructions are given in English, Russian, Tajik, Kyrgyz, Uzbek, and Kazakh; the page is accessible from computers and mobile devices to account for the fact that many people in rural areas do not have access to computers and rely mainly on smartphones for accessing the Internet. When clicking on "Google Maps" next to the respective terroir (i.e., the technical term of French origin for "area of production" in GI branding; Wikipedia, 2023), the user is forwarded to an interactive scene of Google Maps showing the area of production in red (e.g., Figure 7 for the Khorezm Melon). This map shares all the classic navigation functions of Google Maps (i.e., zooming, dragging, exploring by clicking on entries, searching for locations, etc.) and, hence, allows for precise positioning within or without the four areas of production.

The screenshot displays the CANDY-GIS website interface. At the top, there is a search bar and a navigation menu with links for Home, About Us, Regulations, Our network, Projects, Media, Contacts, and Language. Below the navigation, the page title 'CANDY-GIS' is visible. The main content area is divided into five columns, each representing a different language: English (ENG), Tajik (ТОҶ), Uzbek (O'ZB), Kyrgyz (КЫР), and Kazakh (ҚАЗ). Each column provides instructions for using Google Maps to find the production area of a specific product. Below the instructions, there are four product cards, each featuring a product image, a logo, and detailed information:

- Asht Dried Apricot:** Region: Sughd, Tajikistan; Varieties: Mirsanjali Zard (yellow), Surkh (red); Character: sweet with a delicate sour taste; Terroir: Google Maps.
- At-Bashinsky White Honey:** Region: Naryn, Kyrgyzstan; Varieties: mountain monofloral honey; Character: light floral smell with caramel flavor; Terroir: Google Maps.
- Khorezm Melon:** Region: Khorezm & Karakalpakstan, Uzbekistan; Varieties: Gurvak, Zar Gulyabi, Karry Kyz, Beshik, Tyrysh; Character: juicy pulp and pleasant sweet aroma; Terroir: Google Maps.
- Almaty Aport:** Region: Alma-Ata, Kazakhstan; Varieties: Aport Alexander, Blood Red; Character: sweet; among the oldest apple varieties; Terroir: Google Maps.

Figure 6. Current layout of the CANDY-GIS for the four products carrying Geographical Indications (GI) hosted on the webpage of Hilfswerk International (HWI, 2023j). Instructions are given in all main languages spoken in Central Asia; by clicking on "Google Maps", the user is forwarded to an interactive map delimiting the areas of production (Figure 7).

CANDY-GIS, thus, does not only provide explicit references for the associated GI documentation but also offers a practical perspective for local farmers and food processing units to enhance their regional and international market potential.

Moreover, although simple in its setup, CANDY-GIS exemplifies the process of specific technical tool development for livelihood amelioration tailored to the needs of distinct groups of the society (i.e., beneficiary-orientated development), with strong involvement of new technologies, innovative approaches, and a solid scientific foundation. On a small scale, it illustrates positive impacts thanks to close cooperation between various stakeholders. It offers, on a large scale, the

perspective of success in correctly managed joint projects between business associations, universities, consulting services as well as governmental bodies. In this context, Hilfswerk International – like other NGOs – can assist with grant targeting and application, networking and interlinking of suitable partners, communication with governments, needs analyses, culture and language bridging, and project management, all of which are essential – however often underestimated – contributions for successful project implementation in at all stages including pre- and post-project management, as many stakeholders are short on experience in other stakeholders' spheres of action.

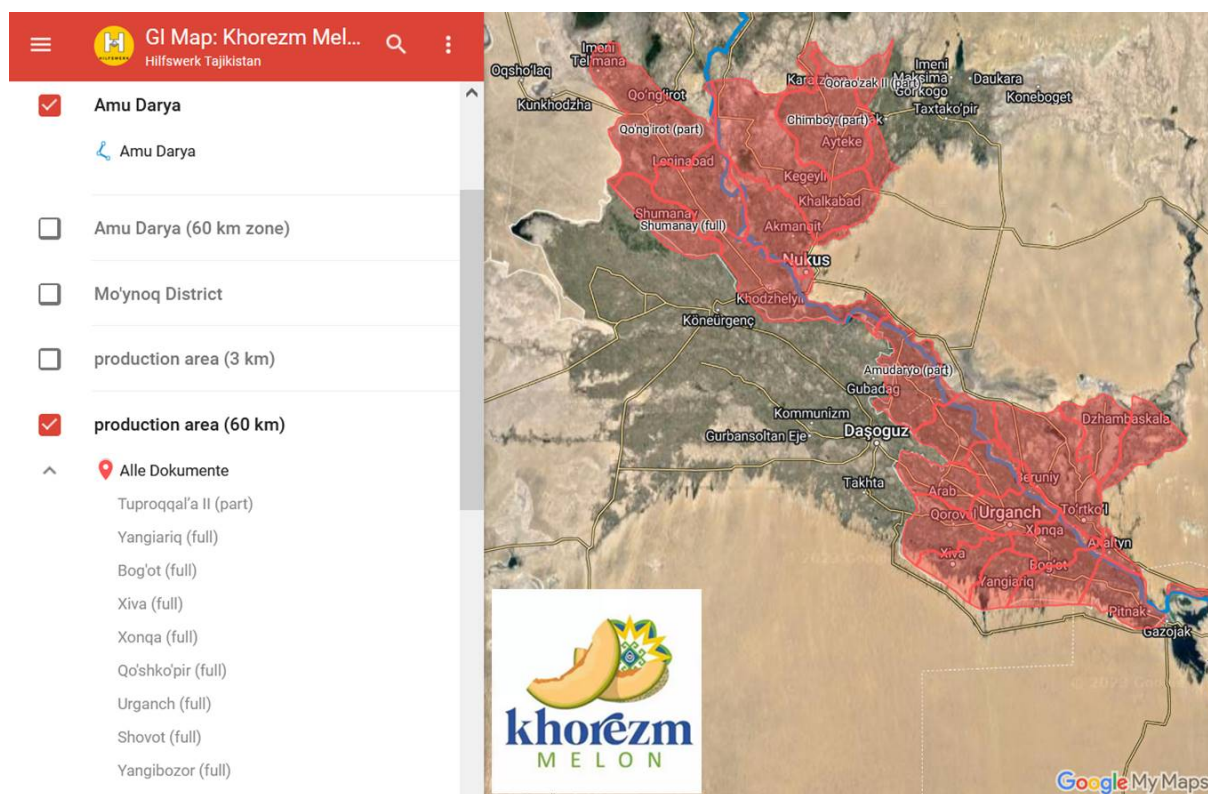


Figure 7. Interactive map delimiting the areas of production of the Khorezm Melon in Khorezm Region and the Autonomous Republic of Karakalpakstan in Uzbekistan. All districts within a left- and right-bank distance of 60 km to the Amy Darya River are considered, with the exception of desert areas, the Turkmen side, and the district of Taxtako'pir excluded by all three criteria. The map is operable like the classic Google Maps.

Conclusions

As part of the umbrella organization Hilfswerk Austria, Hilfswerk International in Central Asia is an active non-governmental organization for development cooperation and humanitarian aid. It focuses on long-term economic development initiatives, skill development programs, job creation strategies, and general capacity building but also provides social and medical assistance. Particular emphasis is laid on sustainable solutions tailored to cultural and social backgrounds on national and regional levels.

With the status of an NGO, Hilfswerk International is not categorized as a scientific, private-sector, or political stakeholder. Based on the success of the project series of CANDY I–V from 2008 to 2022, the HECAFS project from 2016 to 2019, and the currently finishing project AgroDev (since 2021), Hilfswerk International documents its often wrongfully underestimated but essential leading role as mediator between project partners, which might belong to very different sectors such

as associations and unions mainly from the private business sector, universities and other higher education research units, consulting services, and governmental bodies. It demonstrated its long-lasting success of a consecutive and topic-consistent project series in the field of agriculture and food security by goal adjustment, suitable partner combination and lineage of project types that initially have little in common; for instance, the two projects destined to improve higher education systems (i.e., HECAFS and AgroDev) considerably built on Hilfswerk International's previous experience gained during the projects of CANDY I–III, which targeted small agro-industrial businesses and their development. Moreover, Hilfswerk International acts as a driving force for the creation of structures that can sustain themselves long after projects finish, such as the CAWG, a working group carrying on strategies initiated by CANDY I–V and a showcase of trans-border cooperation for common goals between the four countries of Tajikistan, Kyrgyzstan, Uzbekistan, and Kazakhstan.

Considering the multitude of covered thematics, Hilfswerk International has proven not only its significance in successful project management but also its ability to adjust to and navigate through complex thematics. Notably, this latter aspect offers new perspectives for future cooperation of all sorts; while during the last 15 years global interests and the associated funding budgets were predominantly destined to environmental sustainability and green concepts for resource consumption (e.g., concerning raw materials, food production and food safety), also a strong trend towards climate action, global to local scale water household strategies, renewable energy generation, and living space protection as well as social wellbeing becomes apparent – i.a., summarized by the 17 SDGs (Figure 4). To that effect, Hilfswerk International is open to new cooperations, partnerships, and contemporary thematic adjustments to keep up with times in an ever-changing world with new challenges.

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- CANDY III: Central Asia Invest III, No. DCI-ASIE/2013/315-378
- CANDY IV: Central Asia Invest IV, No. ACA/2016/382-048
- CANDY V: Central Asia Invest V, No. ACA/2019/412-281
- HECAFS: Erasmus+ EPHE, No. 574005-EPP-1-2016-1-LV-EPPKA2-CBHE-JP
- AgroDev: Erasmus+ CBHE, No. 619039-EPP-1-2020-1-LV-EPPKA2-CBHE-JP

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Competing interests

The authors declare no competing interests. Hilfswerk International does not engage in political action.

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