IT4D.nl

33 SHOWCASES

Digitalisation
& Development

Inspiration from Dutch
development cooperation

Table of content

Acronyms

AI	Artificial intelligence
B2B	Business-to-Business
B2C	Business-to-Consumer
CSO	Civil society organisation
DDoS	Distributed Denial of Service
DGGF	Dutch Good Growth Fund
EUTF	EU Emergency Trust Fund for Africa
FMO	The Netherlands Development Finance Company
GDPR	EU General Data Protection Regulation
GIS	Geographic Information Systems
GPS	Global Positioning System
IDP	Internally displaced person
IPR	Intellectual property right
LGBTI/Q	Lesbian, gay, bisexual, transgender, intersex / queer
MoFA	Ministry of Foreign Affairs
NGO	Non-governmental organisation
OCR	Optical Character Recognition
SACCO	Savings and Credit Cooperative Society
SDG	Sustainable Development Goal
SMEs	Small and medium-sizes enterprises
SRHR	Sexual and Reproductive Health and Rights

Buzzwords

Algorithm
In mathematics and computer science, an algorithm is an unambiguous specification of how to solve a class of problems.
It is a complicated mathematical code that allows the computer to process data without the need of human intervention.

Artificial Intelligence (AI)
AI is an area of computer science that emphasises the creation of intelligent machines that work and react like humans.
It refers to making computational models of human behaviour and of human thought processes and building computational systems that behave intelligently or rationally.
Imagine that you wanted to make a programme that played poker. Instead of making the best possible poker-playing programme, you would make one that played poker like people do.

Big data
Extremely large data sets.

Biometric data / authentication
Biometric authentication uses human characteristics (physical or behavioural) to digitally identify a person to allow him/her access to data, devices or systems.
Examples of these biometric identifiers are fingerprints, facial patterns, voice or typing cadence.

Blockchain
A mathematical structure for storing data in a way that is nearly impossible to fake. It can be used for all kinds of valuable data.
More on blockchain ▶

Cyber security
The protection of computer hardware and software against damage, failure and abuse.

Data for Good
"Data for good" refers to the idea that data can be used as a tool to accelerate development, reduce poverty, spur innovation, and improve accountability and transparency.

Data protection / digital privacy
Data protection is about individuals' entitlement to decide how their data are used, how to maintain their privacy and how to protect themselves against the misuse of their data (e.g. by companies or governments).

Digital divide
The divide between people with or without the opportunity to use digital technologies, such as the Internet. This may be due to a lack of technical access or know-how, or the unavailability of suitable services.

Digital literacy
The ability to use digital devices such as computers, tablets or smartphones.

E-governance
The use of digital technologies in government and administration to effectively shape decision-making processes, procedures and interactions between public sector, civil society and private sector actors

in a more transparent, demand-oriented, participatory manner.

E-health
The use of electronic media to deliver healthcare and medical treatment and advice in the event of illness.

Enterprise resource planning (ERP)
ERP is the integrated management of core business processes, often in real-time and mediated by software and technology.

FinTech (from 'financial technology')
An emerging financial industry that applies new technology (specialised software, applications, algorithms, business models etc.) to improve and automate the delivery and use of financial services for companies as well as the general public.

Geographic Information System (GIS)
A system that geographically pinpoints information, linking data to points on digital maps, for example.

Information
Information refers to data which has been analysed for the purpose of decision-making or communication.

Information Communication Technology
Devices, sensors, software, hardware, systems, and networks used for the collection, processing, analysis, and dissemination of information often, though not always, in a digital format.

Internet governance
The formulation and application of common principles and regulations for the design and use of the internet.

Machine learning
Most Artificial Intelligence advancements and applications refer to a category of algorithms known as machine learning. Machine-learning algorithms use statistics to find patterns in massive volumes of data (e.g. numbers, words, images, clicks, etc.). If it can be digitally stored, it can be fed into a machine-learning algorithm.
More on machine learning ▶

Massive Open Online Course (MOOC)
Free online courses with an unlimited number of participants.

Open source
Open-source computer programmes (i.e. 'R' data analytics software) can be used free of charge and, in theory, be modified by anyone. The open-source concept is not confined to software, but also includes areas like knowledge and design, such as 3D printing.

Definitions have been taken (and sometimes adapted) from a range of online sources and institutes, including the German BMZ's Glossary for Digitalisation and Sustainable Development ▶

Introduction

How can digital approaches add value to development interventions?

That is the key question of this publication. Over the past two decades, the global information society has seen an upsurge of innovative approaches to international cooperation in which (big) data and digital technologies have taken central stage.

It is important to grasp the potential impact of these interventions and to distil lessons learned for the formulation of future Digitalisation & Development strategies and policies.

This publication offers a glimpse into the potential impact of, and the risks and challenges that come with introducing digital solutions across the thematic areas of the Ministry of Foreign Affairs of the Netherlands. For each of the themes, inspiring examples of interventions that receive direct or indirect support from the Ministry are presented, highlighting the added value of the

digital approach for reaching impact [1].

For example, the increasing penetration of mobile phones and, to a lesser extent, (mobile) internet in developing countries has been a trigger for all sorts of digital innovations, ranging from more transparent e-governance, to low-threshold m-banking, and affordable m-health.

Such innovations potentially support more inclusive development and growth by enhancing access to affordable quality health care for the poor, providing low-cost or free information services to smallholder farmers, or creating transparency of government processes to fight corruption.

Digitalisation can also contribute to effective climate change action. Examples include using geodata to

chart deforestation trends, geospatial mapping for planning renewable energy projects, or introducing digital devices to support district-level policies on safe drinking water.

Looking at the justice sector, support can now be given to low-income or rural communities with a click of the button. At the same time, examples also show that especially in the fields of security, justice and human rights, the ethical use of big data and advanced data analytics is an urgent concern.

The showcases presented are not exhaustive of the developments taking place in the different development sectors. However, they have been carefully selected as inspirational approaches that can support decision-making processes and policy developments about digital innovations at the Ministry.

The rise of a buzzword

The relevance of digital approaches has gained momentum in international debates and governance [2].

Since the first UN resolution concerning digitalisation and development assistance was adopted in 2001, its potential impact has been increasingly recognised at the international stage. Over time, the debate has covered issues ranging from cybersecurity and e-governance to closing the digital divide and maximising the contribution of ICT for realising the SDGs.

Digitalisation, it is widely acknowledged, can both maximise the number of beneficiaries of an intervention and lower the threshold for vulnerable groups to enjoy democratic rights, have equal access to basic services, or participate in public and economic life [3].

At the same time, the generation of huge volumes of data through

increased automation and computerisation of societies everywhere is turning data into an important strategic asset [4].

The digital hype has made it nearly impossible to steer clear from

buzzwords such as "big data", "blockchain" or "artificial intelligence". Yet, it is not always clear what is meant by these terms. For short descriptions of frequently used 'digital' terms, please refer to the list of buzzwords ▶

Digital Principles

In 2012, the Digital Principles were introduced to institutionalise lessons learned in digital development practices.
As a set of living guidance, they are intended to help practitioner's success in applying digital technologies to development programmes.

The 9 principles include:

1 Design with the user
2 Understand the existing ecosystem
3 Design for scale
4 Build for sustainability
5 Be data driven
6 Use open standards, open data, etc.
7 Reuse and improve
8 Address privacy and security
9 Be collaborative

For a full description of the principles ▶

Two elements of digitalisation

Even the word 'digitalisation' itself can throw up questions.

In this publication, digitalisation comprises two key components:
• better use of (big) data
• introducing digital technologies

Big data refers to large volumes of data that are drawn from different sources, such as telecom records, social media, customs or tax records, GPS devices, or satellite data. Machine learning and artificial intelligence are increasingly applied to make sense of the data, identify patterns and categories, and possibly make predictions of future courses of action and behaviour.
The analysis of such big data is presented in risk maps, shapefiles, statistical dashboards (on people's mobility, food prices, healthcare uptake, etc.), solar and wind atlases, or GIS web portals, to name just some formats.

The second component of digitalisation, introducing digital technologies, refers to online instruments, devices, software systems and applications that help to reduce costs of interventions, expand their range of services or enhance inclusive access to quality services. These are the tools, devices and systems that generate, store or process the data. Think of tools such as social media, online games or mobile payment apps; devices such as mobile (smart-)phones, tablets, diagnostic imaging or remote sensing equipment; or systems such as credit analytics engines or online dashboards and information platforms.

The digital ecosystem

The purpose of this publication is to inspire. Technical aspects, such as data quality, how to deal with metadata, data gaps, data bias, standards and interoperability are not dealt with. Equally, no in-depth analysis of ethical and legal considerations, such as those related to IPR, informed consent and privacy, data protection and ownership regulations, or accountability, is provided, although these issues are touched upon in some of the showcases. The showcases in this publication all illustrate the innovation power of ICT, yet at the same time they bring across the message that technology itself is not the solution. The added value lies in the eco-system that is created and which facilitates the use of technology to enhance the impact of development interventions. It requires a balanced combination of people, processes and digital solutions to serve the common good. As Jeffrey Sachs has framed eloquently in the report ICT & SDGs (2016) ▶, "technology must be combined with a will towards the common good" in order for it to reach its intended impact.

[1] The SDGs that are listed with each showcase, are the SDGs formally associated with the relevant thematic area of the MoFA. It is noted that many interventions have an additional direct or indirect impact on other SDGs.

[2] For a description of this process over time, refer to Schia (2018) The cyber frontier and digital pitfalls in the Global South. Third World Quarterly ▶

[3] DGD (2016) Digital for Development (D4D) for the Belgian development cooperation ▶

[4] OECD (2019) Going Digital: Shaping Policies, Improving Lives ▶

Civil Society

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

Project: VOICE

## Ensuring the right voices are at the table, rather than on the menu

The Internet and 'digitalisation' have been hailed as the harbingers of global inclusion and equality, offering a way to the marginalised to gain power. However, roughly 52% of the world remains offline. And in many communities across the globe there is a strong digital divide. For the frontrunners in the technological revolution, digital approaches such as vlogging, audio recordings or SMS services, may seem rather outdated. The Voice ▶ grant facility shows that much ground can be covered by introducing such basic, yet highly inclusive, digital approaches to make

true the ambition to "leave no one behind" and ensure "nothing about us without us". Voice supports the most marginalised and discriminated people in ten low- and lower-middle income countries in Africa and Asia. The facility aims to increase the (political, social and economic) participation in mainstream development processes of people living with disabilities, LGBTI people, women facing exploitation, abuse and/or violence, age-discriminated vulnerable groups (the young and elderly), and indigenous groups and ethnic minorities.

Achievements and added value

Voice builds on the important function that wide-spread social media platforms and audio/video technologies can offer to marginalised groups and those living in challenging environments. The facility builds heavily on the use of social media in its outreach strategy to difficult-to-reach groups and uses digital platforms and networks to amplify their 'unheard voices'.

These approaches include inclusive application and reporting processes:
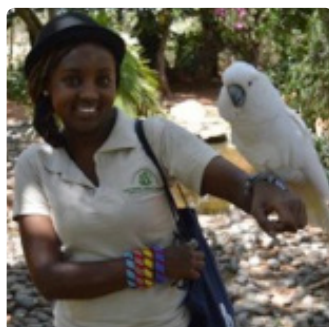
Voice Talks
Determined and unbowed

24 dagen geleden

0:03   12:19

Een reactie schrijven

♡ Liken   ⇄ Reposten   ⬈ Delen   ••• Meer   ▶ 6

Voice allows potential grantees to submit their application, and grantees to submit reports, in audio or video files. An example of such a report can be found here ▶

The work of Voice grantees is portrayed on different online media channels, using blogs, vlogs and podcasts. Using different communication tools increases the outreach scope of the grantees and is inclusive to, for instance, (semi-) illiterate people.

Several grantees are benefiting from the Innovate and Learn opportunities that Voice offers, which allows them to test more innovative approaches. In Uganda, Albinism Umbrella ▶ uses GPS to collect data about the locations of People Living With Albinism across the country to better strategise for future outreach and support services.
Voice acknowledges the potential dangers in spatial profiling in light of privacy issues and has advised the grantee to develop protective measures.

Another inspiring example is that of

Data4Change ▶ that supports human rights defenders by securing hosting and technical support for websites under threat from being hacked or shut down.

Key challenges and solutions

• Using digital media to connect and influence for change proves to be both a blessing and a curse. Internet is exponentially expanding, thanks to high mobile penetration and spread.
In East Africa, especially Tanzania, mobile phones are now the major channel for citizens' access to the internet, providing open spaces to express themselves.
However, technology-assisted violence against women and minority groups is on the rise.
The government in Tanzania is using technology for mass/indiscriminate surveillance, ignoring privacy rights.

• Voice has learned that when you make discriminated or marginalised people more visible, you also make them more vulnerable. This requires careful

reflection and revisiting of project objectives to ensure the interventions remain user-centred.

• While social media and digital outreach strategies are relevant in the process of including the most excluded, Voice recognises that certain groups and areas still require on-the-ground interaction.

In fear of "witch hunts", the Tanzanian LGBTI community, for example, tries to stay under the radar as much as possible – both online and offline. Or, certain ethnic minorities in Kenya face reprisals if meeting in public, which means that the Voice partners must come to physical meet such grantees rather than the other way around. The logistics and possible financial and human resources burden associated with that process, continues to pose challenges in reaching the most excluded.

VIDEO
I see you, I hear you, I am you

MoFA
theme
Civil Society

Sustainainable
Development
Goal

10 REDUCED INEQUALITIES

Digital
technology
Online platforms
Social Listening and
Natural Language
Processing techniques

Country or region
Burundi, China,
Democratic Republic of
Congo, Egypt, India,
Kenya, Libya, Mexico,
Nigeria, Uganda,
Syria, Yemen

Lead implementing
organisation
RNW Media

Project: Digital communities **for social change**

Preventing echo chambers: depolarising the conversation on social media

Globally, nearly 2.8 billion people use social media monthly. Digital spaces can offer a private and anonymous setting to discuss sensitive or taboo subjects such as homosexuality, women's rights, or the aspirations of young people. RNW Media has specialised in building such inclusive digital communities of young people for social change. Their platforms under the Citizen's Voice ▶ and Love Matters ▶ programme recorded over half a billion content views in 2018 alone.

(Courtesy: RNW Media)

By introducing creative approaches to data processing and analysis, RNW Media's digital teams around the world can create content, which is relevant, accessible and engaging to young people. They have pioneered moderation strategies to support inclusive digital communities and have significantly boosted the participation of women in specific country settings. Through Social

Listening methodologies, RNW Media analyses online conversations on multiple platforms across the digital landscape to identify digital influencers and map topics and sentiments in the national arena.

Using Natural Language Processing techniques (such as sentiment and topic detection models), RNW Media can mine text and analyse this data

to unravel deep insights into how online dialogue is developing over time. This helps to establish the social impact of the online moderation strategies while at the same time collecting evidence that can be used to advocate for young people's needs.

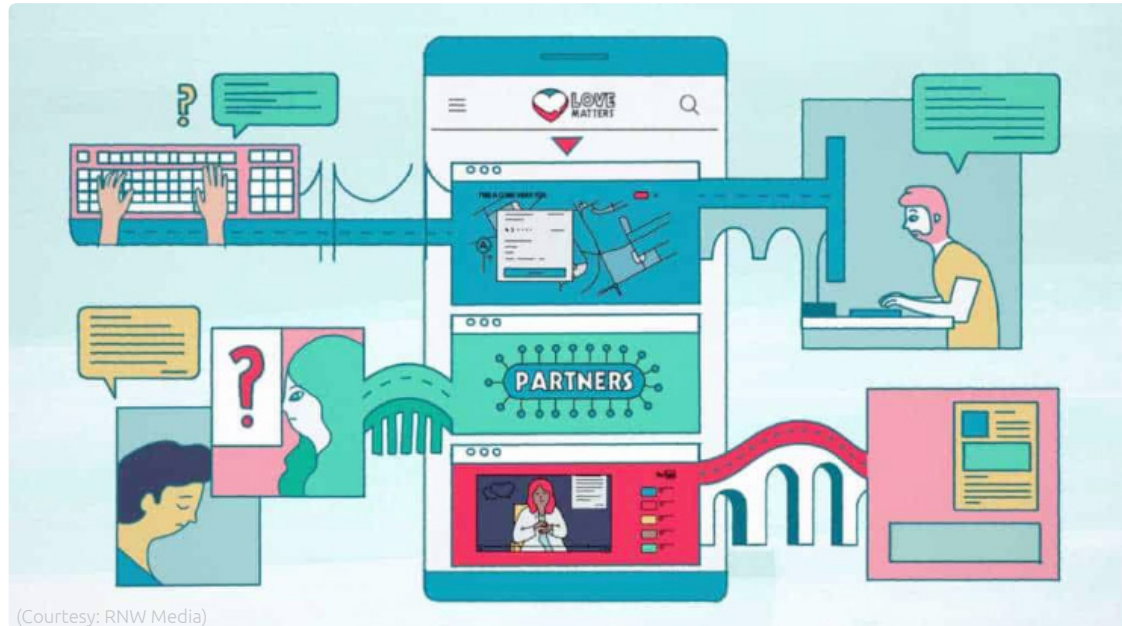RNW Media has invested in a highly-qualified Data & Digital core

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MoFA
theme
Civil Society

Sustainainable
Development
Goal

10 REDUCED INEQUALITIES

Digital
technology
Online platforms
Social Listening and
Natural Language
Processing techniques

(Courtesy: RNW Media)

Country or region
Burundi, China,
Democratic Republic of
Congo, Egypt, India,
Kenya, Libya, Mexico,
Nigeria, Uganda,
Syria, Yemen

Lead implementing
organisation
RNW Media

team in the Netherlands that works closely with local counterparts in-country who take the lead in moderating the platforms and using the evidence for advocacy purposes.

Achievements and added value

The introduction of Social Listening and other moderation methodologies has allowed RNW Media to produce insights into the behaviour, mind-set, sentiments and needs of young people.

These insights have been used to influence decision-makers through an evidence-based advocacy approach on issues such as safe abortion or SRHR. The platforms have over 11 million followers on social media, who interacted more than 20 million times in 2018. This level of scale and reach means they can speak for a bigger constituency than if their advocacy was based on more traditional surveying approaches. The scale of the communities also ensures that

governments take notice of their conversations, and that national and international media pick up on it too.

The 'plug & play' platforms allow RNW Media to replicate its approach across new contexts and countries.

The look and feel of the website will be local, but the technology behind it has been standardised for increased efficiency. Pilots will be launched in 2019 using machine learning and artificial intelligence approaches to investigate how propaganda tends to spread (Burundi) as well as the role moderators play in influencing digital spaces (Google partnership).

Key challenges and solutions

- Reaching such large scale comes at a price: the more visible you are, the easier it is to target the platform and the groups it represents. RNW Media therefore tries to manage their influence carefully and positions the organisation as a constructive partner with the dominant authorities. To make true its promise of providing a safe space

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theme
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technology
Online platforms
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Democratic Republic of
Congo, Egypt, India,
Kenya, Libya, Mexico,
Nigeria, Uganda,
Syria, Yemen

Lead implementing
organisation
RNW Media

for young people to speak their minds, RNW ensures that data is protected and aggregated as much as possible to avoid traceability.

Capacity trainings are organised with local teams as well as shared learning with organisations such as the Open Data Institute, on issues such as data trust and data sharing.

• Another challenge is by-passing discriminatory or protective algorithms. Little information is publicly available on the algorithms used by Facebook, Google, Twitter and other information gatekeepers.

However, it is clear that these algorithms help to make certain provocative articles go viral, or, on the other hand, block or censor information that is identified as 'obscene or sensitive content'.

RNW Media analysed that content related to women's health or hygiene issues is censored much more frequently than content targeted at men. This bias is consistent across regions and

illustrates the gender bias embedded in the internet. Women already face more cases of online harassment, and the algorithms can further impede their digital inclusion and participation.

RNW Media has reached out to the relevant gatekeepers to seek solutions to this censorship and will share data evidence on this issue at international gatherings such as the Internet Governance Forum.

• Governments too are actively and increasingly restricting the digital space that RNW Media and its partners roam. They impose restrictions such as license fees or registrations for online influencers as a way of monitoring and blocking "undesirable" content.

The Egyptian government passed a regulation stipulating that Facebook users with over 5,000 followers fall under the national Media Laws. RNW platforms must therefore walk a careful line between supporting young people on the issues they care about most and ensuring that

those same young people are safe and seen as constructive contributors to their societies.

• To have meaningful impact in the digital space requires substantial budgets for investment in highly sought-after skill sets, longevity, flexibility, and creativity. Rapid changes in the digital landscape require interventions to be continuously optimised.

RNW Media therefore calls for more adaptive funding approaches to ensure that the potential of digitalisation will be seized in new development policies and interventions.

VIDEO
Habari RDC
community of Congolese bloggers

MoFA theme
Civil Society

Sustainable Development Goal

10 REDUCED INEQUALITIES

Digital technology
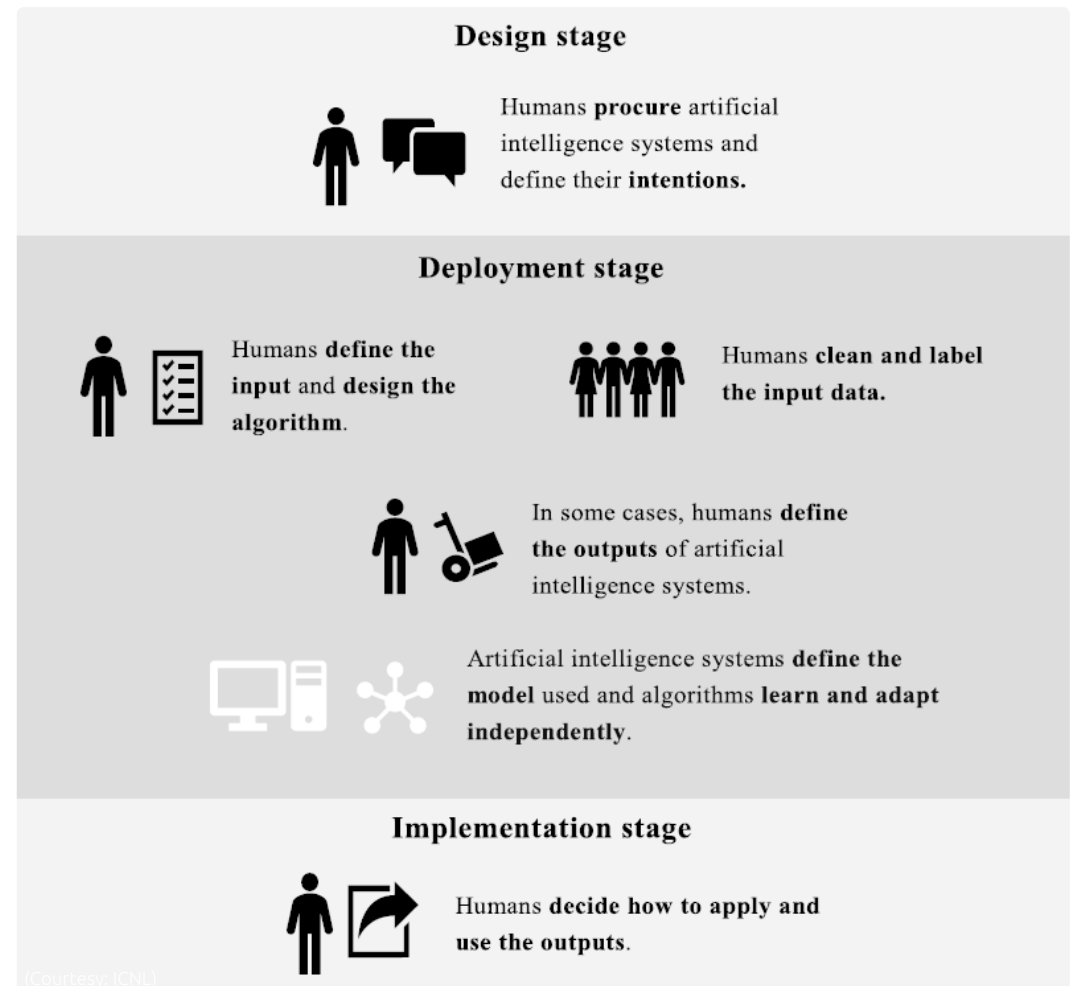AI judicial framework

Country or region
Global

Lead implementing organisation
The International Center for Not-for-Profit Law (ICNL)

Project: Artificial intelligence policies

Building norms and standards to safeguard digital civic space

Artificial intelligence technology and policy have the potential to either restrict or amplify civic freedom. This will depend on how international, national and individual actors use it. Governments are increasingly trying to restrict online civic space, for instance by using software that supports predictive policing or AI-based applications such as Netsweeper that can scan and block specific 'sensitive' content (Kuwait, Qatar). In response to this surge in restrictive measures, the International Center for Not-for-Profit Law (ICNL) ▶ is rolling out initiatives to ensure that the protection and promotion of civic freedom is a key consideration in the development and adoption of AI technology and policy.
ICNL works on developing international norms, improving domestic policies and laws, enhancing AI fluency, and using "AI for good" across 100 countries.

Design stage

Humans **procure** artificial intelligence systems and define their **intentions.**

Deployment stage

Humans **define the input** and **design the algorithm.**

Humans **clean and label the input data.**

In some cases, humans **define the outputs** of artificial intelligence systems.

Artificial intelligence systems **define the model** used and algorithms **learn and adapt independently.**

Implementation stage

Humans **decide how to apply and use the outputs.**

(Courtesy: ICNL)

Achievements and added value

To encourage (inter)national norm-setting, ICNL supports UN Special Rapporteurs with research and advice to ensure that AI issues receive the attention they deserve. The neglect of human rights issues in (inter)national AI policies could lead to rapid developments of AI technology, for instance in the security sector, with little meaningful engagement by civil society. Civil society organisations can act as supervisors of AI technology that is already employed – following how it is being used and reviewing the effects. Through such oversight, some control can be regained over how algorithms are infiltrating our lives.

This is one of the reasons why ICNL focuses on strengthening the capacity of CSOs in the field of the emerging AI dialogue. Partners of ICNL have shared their concern that they lack sufficient knowledge about AI for them to effectively engage with policy makers in a constructive dialogue. To overcome this hurdle, ICNL offers training for grassroots

leaders to help them understand what AI is, how it works, and how it affects their work. Together with Stanford University, ICNL will convene a 3-day tech-camp in 2019 for civic space defenders, where they can boost their fluency in digital technologies. Participants will explore tech cases 'for good' as well as restrictive examples. They will learn what policy developments (both national and international) need to be closely followed and supported in engaging in national policy contexts. ICNL is also exploring the opportunity to organise a MOOC (Massive Open Online Course) to scale their educational initiative.

Finally, ICNL is also concerned with encouraging a strategic debate on how CSOs can utilise AI for good. The organisation sees the potential of AI to provide better, faster services to citizens, as some examples in this publication show. However, such processes are costly and CSOs have limited resources to invest in emerging technologies. ICNL sees opportunities in low-cost and pro-bono expertise to CSOs, or

government subsidised knowledge transfers to foster organisational literacy and innovative developments in AI.

Key challenges & solutions

• The human rights and civil society sectors seem to underestimate the potential impact of the increasing use of AI in society. Tech companies who develop AI for different purposes, do not necessarily take into consideration the responsible and appropriate use of the technology.

This realisation triggered ICNL to develop Codes of Practice to determine what civil society understands by responsible practices. It requires more consideration in terms of, for example, gender (dis)balances and questions of (digital) discrimination. ICNL calls for action, sooner rather than later, before economic and bureaucratic investments have been made and it will be more difficult to redirect the fundamental discussions about the ethical use of AI.

Climate

MoFA theme
Climate

Sustainainable Development Goal

13 CLIMATE ACTION

Digital technology
Online platform
Digital databases and data processing
Geodata (including Earth observation)

Country or region
Global
started in Latin America

Lead implementing organisation
Stockholm Environment Institute (SEI)
Global Canopy (GC)

Project: TRASE

(Transparent supply chains for sustainable economies)

Improving transparency and sustainability of commodity flows

Agricultural expansion to produce commodities such as soy, palm oil, timber, and beef is driving two thirds of tropical deforestation worldwide. Forests are cleared to make way for farm land, destroying valuable wildlife habitat, affecting the livelihoods of local communities, and exacerbating climate change.

The mission of Trase ▶ is to be an independent provider of science-based, credible information on the production, trade and sustainability of globally traded agricultural commodities. Through its online platform, Trase enhances the transparency, clarity and accessibility of such information.

The data can be used to support committed companies and governments in improving the sustainability of their operations, whilst also supporting the work of civil society and other observers to

strengthen accountability processes. Banks and investors in agricultural production as well as consumer governments also make use of the information.

Trase is a non-profit entity and does not act as a service provider or campaigning organisation, but works in partnership with actors from all sectors.

Trase maps the entirety of the middle part of the supply chain (not "farm to fork") and identifies common hotspots.

This supply chain mapping builds on an enhanced form of material flow analysis called Spatially Explicit Information on Production to Consumption Systems (SEI-PCS).

Three combined capabilities of the Trase approach set it apart from other approaches to supply chain mapping:

- It systematically links individual supply chain actors to specific, subnational production regions, and the sustainability risks and investment opportunities associated with those regions

- It identifies the individual companies that export, ship and import a given traded commodity

- It covers all exports of a given commodity from a given country of production

Trase is designed for three major groups of target actors:

- Market actors, including commodity traders and other buyers (including manufacturers, retailers, and consumer countries), as well as banks and investors concerned about reputational, legal and operational risks of unsustainable production

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Climate

Sustainainable
Development
Goal

13 CLIMATE ACTION

Digital
technology
Online platform
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and data processing
Geodata (including Earth
observation)

Country or region
Global
started in Latin America

Lead implementing
organisation
Stockholm Environment
Institute (SEI)
Global Canopy (GC)

- Territorial governments concerned with strengthening sustainability governance and developing public-private partnerships capable of delivering jurisdictional sustainability

- Civil society organisations and other observers concerned with strengthening accountability to ensure progress by companies and governments against standards, targets and commitments

Achievements and added value

Trase is at the forefront of a data-driven revolution in supply chain sustainability, drawing on vast sets of production, trade and customs data, for the first time laying bare the flows of globally traded commodities at scales that are directly relevant to decision-making.

Its pioneering approach to data analysis and visualization provides full coverage of the export routes and buyers responsible for all production and trade, and the associated sustainability risks, of a given commodity.

Trase does this by making the most of existing, publicly available, data. Some datasets have to be purchased. The clever combination of different data sources is what makes Trase unique.

The criteria for data collection, processing and analysis are:

- What is feasible to collect?
- What is needed to drive behavioural change?

To maximise impact Trase actively engages with key data users in the private, public and civil society sector to assess uptake and use of the platform and identify needs and opportunities for improvement. This includes working with organisations that provide guidance for companies and governments and can multiply outreach with target users and raise awareness of the platform.

Broad coverage also ensures that shifts in the sourcing patterns of a particular buyer or trader, and associated social and environmental impacts and risks, can be tracked and assessed over space and time.

The initial focus of Trase was mapping the supply chains of Latin American soy. It has since expanded to include beef in Brazil and Paraguay and palm oil in Indonesia. Additional commodities and countries are in the pipeline as the platform develops.

Key challenges and solutions

- As a public transparency platform, Trase is dependent on external, mostly public, funding.
Ideally, Trase becomes part of a harmonised supply chain transparency network, which refers people to the most relevant platform for their queries.

The founders of Trase, SEI and GC, have established the Supply Chain Transparency Network ▶ to achieve exactly this.

Video (on website TRASE)
Learn about Trase in two minutes

MoFA theme
Climate

Sustainainable Development Goal

13 CLIMATE ACTION

Digital technology
Geographic information systems (GIS)
Earth observation (wind & solar atlas)
Open data and analytics
Machine learning

Country or region
Global
> 130 countries

Lead implementing organisation
World Bank

Project: ESMAP
(Energy Sector Management Assistance Program)

Accelerating the energy transition

The aim of ESMAP ▶ is to accelerate the energy transition required to achieve SDG7 (to ensure access to affordable, reliable, sustainable and modern energy for all), while contributing to SDG 13.

ESMAP provides technical assistance and advisory services in many areas, including mini grid and off-grid solutions, clean cooking and heating, energy efficiency, de-risking geothermal applications, battery energy storage, sustainable hydropower and energy subsidy reform.

The programme generates knowledge on energy access, renewable energy and energy efficiency. The intended users of this knowledge are governments, energy practitioners, the private sector, think tanks and academia.

The main focal areas are energy

access, renewable energy and energy efficiency and the intended users are governments, energy agencies, energy consultants and construction companies.

ESMAP helps to shape World Bank Group (WBG) strategies and programmes to achieve the WBG Climate Change Action Plan targets:

• achieve 28% of WBG financing with climate co-benefits
• scale up 20 GW in renewable energy generation and integrate an additional 10 GW of variable renewable energy sources into grids over 5 years
• mobilise $25 billion in commercial funds for clean energy
• invest at least $1 billion to promote energy efficiency and resilient buildings by 2020
• increase support to policy actions for sector reform, including fossil fuel subsidies reform

ESMAP supports all regions where the WBG is active based on regional demand and priorities.

For example, in Africa the focus is on strengthening utilities, regulation and power system planning, regional integration of electricity infrastructure and trade, renewable energy scale up (particularly hydropower and solar, with associated transmission requirements), increasing access to electricity (off-grid and grid-connected), facilitating private sector investment, and increased application of geospatial planning.

Gender aspects in the energy sector receive special emphasis in ESMAP, and as a result gender considerations are now being mainstreamed in WBG projects across all six regions.

MoFA theme
Climate

Sustainainable Development Goal

13 CLIMATE ACTION

Digital technology
Geographic information systems (GIS)
Earth observation (wind & solar atlas)
Open data and analytics
Machine learning

Country or region
Global
> 130 countries

Lead implementing organisation
World Bank

Achievements and added value

Thanks to the huge investments that are generated, the programme is realising impressive figures: 56.5 million people are provided with access to electricity, 72 million beneficiaries are expected to be reached, a CO_2 reduction of 440 million ton is expected, and 2.2 gigawatts of renewable energy will be installed.

ESMAP also invests in geospatial mapping and data to help countries plan energy projects. For example, digital technology was used for the development of a global solar and a global wind atlas (GIS and Earth observation) and electrification planning (GIS) to enable countries to design electrification strategies with least-cost investments.

This has contributed to a tripling of grid-connected households in Rwanda, from 110,000 in 2008 to 357,000 in 2012. ESMAP also supports various data platforms that are used to measure progress on SDG7 with Tracking SDG7: The Energy Progress Report ▶, and to assess sustainable energy policies in each country with Regulatory Indicators for Sustainable Energy (RISE) ▶.

The programme moreover supports an open data and analytics platform called ENERGYDATA.INFO ▶.

The platform has been developed as a public good available to governments, the private sector, NGOs, academia, civil society and individuals to share data and analytics that can help in achieving the sustainable energy targets of SDG7.

Key challenges and solutions

• The electrification planning model has global potential and ESMAP is working with a range of partners, including Google and Facebook, to support its development.

• Helping countries to reach universal electrification and scale up the use of solar and wind energy remains a challenge. That is why ESMAP and the WBG support the development of technologies such as geospatial analysis.
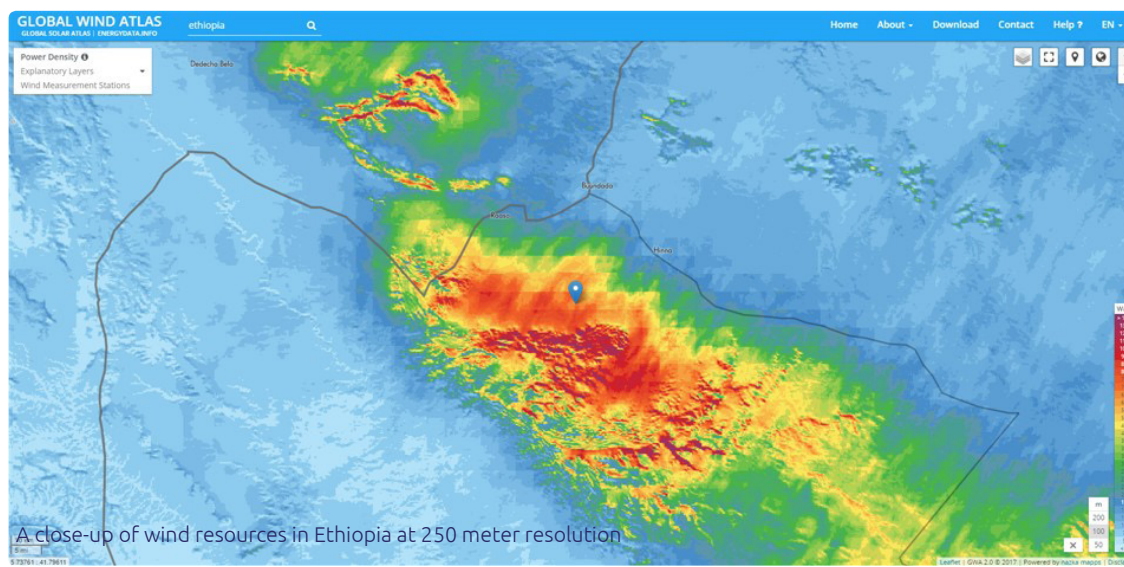
A close-up of wind resources in Ethiopia at 250 meter resolution

VIDEO
In Ghana, solar-powered mini-grids bring security and new economic opportunities

MoFA
theme
Climate

Sustainable
Development
Goal

13 CLIMATE ACTION

Digital
technology
Web portal
Machine learning
Geodata
Mobile phone technology
Drones
Camera traps
Webinars

Country or region
16 countries in Africa,
Asia and Latin America

Lead implementing
organisation
WWF and IUCN,
Netherlands

Project: SRJS
(Shared Resources, Joint Solutions)

Using digital technologies
to support the protection of global public goods

SRJS ▶ is a strategic partnership
program between WWF, IUCN NL
and the Dutch Ministry of Foreign
Affairs. The aim is to help civil society
organisations increase their
influence in multi-stakeholder
partnerships with governments and
business, and strengthen their
leverage in successfully advocating
and lobbying for inclusive and green
development.

SRJS follows a landscape approach
that combines conservation goals
with production, livelihood, cultural
and institutional goals.

The landscape approach has several
working principles:
• making use of dialogue-oriented
  multi-stakeholder platforms
• shared understanding
• collaborative planning
• effective implementation
• monitoring

Participants in the Ghana workshop on Business Engagement

There are 26 target landscapes
across 16 countries. In close
cooperation with its partners, the
initiative is supporting training,
capacity building and strategic
development opportunities.
The training builds on North-South
and South-South peer learning and
consists of specific demand-driven
clinics, webinars and workshops on
topics such as developing tailored
business cases for action,
communication and negotiation skills
and valuation of ecosystem services.

22

Achievements and added value

Digital technology is used for lobbying and innovative monitoring. In Zambia, for example, all dams are mapped with satellite imagery and GPS to make a complete inventory with the goal to improve water allocation. This is a cooperation between CSOs and government, directed at sustainable landscape management, climate resilience and inclusive economic development. Another example that fits the landscape approach is the early warning system for predicting deforestation in Kalimantan, Indonesia, which makes use of automatic land cover classification by machine learning. Government, local institutions and other stakeholders are represented and work together in the users board.

A number of workshops and webinars have been held. Training is (until now) directed at topics such as how to engage businesses, human rights in conservation and applications of drones and GIS. Participants learn about the need for business engagement, how it can be

effectuated and how transformational engagements can be designed with businesses. A handbook on influencing has been produced. The handbook is an interactive PDF and describes how to develop and implement an influencing strategy in practical steps. It also gives advice on how to analyse and deal with different roles and power arrangements. It is distributed through the network.

Key challenges and solutions

- SRJS aims at establishing strategic partnerships and capacity development. The behavioural change that can only be achieved through a bottom-up approach takes a long time, especially if laws and regulations need to be to changed, implemented and enforced. This means that a programme approach is more effective than a project approach.

- Apart from technical challenges, the application of digital technology does not go unquestioned. In Guyana, for example, local communities are

going to participate in water quality testing to check on the effects of mining operations in the area (in cooperation with Caddisfly ▶), but they resisted storing their data in the cloud. This was partly due to not knowing what the "cloud" was, but also had to do with data ownership and they therefore addressed an important aspect of digital technology.

- Wherever possible, businesses should invest in the landscape approach. However, cooperation of businesses is not always guaranteed and the relationship between CSOs and business is often not very intensive and sometimes problematic. As SRJS uses dialogue / cooperation as the basic principle in the approach (and sometimes dissent), the financial sector that funds unsustainable enterprises can be influenced to get these businesses involved in the discussion and on board as partners.

VIDEO
Humans and mangroves in balance

Food Security

Project: The LAND Partnership
(Land Administration for National Development)

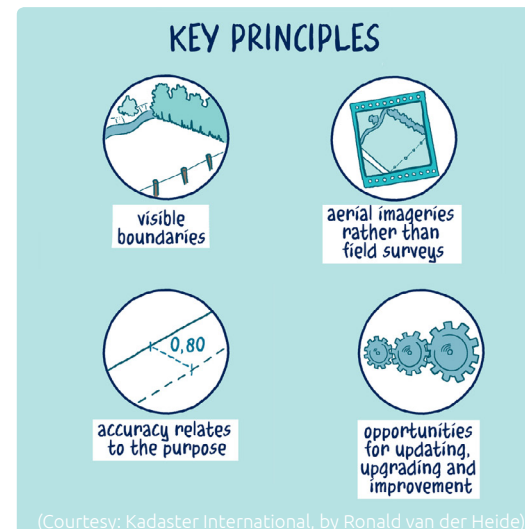## Designing fast and affordable land administration to meet people's needs

Land administration is a fundamental infrastructure for the sustainable economic and social development of all societies.

It is estimated that around 70% of the people-land relationships in the world are not documented. In a context of ongoing population growth and increasing pressure on land and natural resources, this results in many land conflicts and competing claims on land. Appropriate administration of land, providing clear and intelligible land information, is the start of conflict resolution and sustainable land use (planning) anywhere in the world.

The Fit-For-Purpose Land Administration approach is a dynamic process. A flexible and pragmatic approach allowing for land administration systems to be incrementally improved over time whenever necessary or relevant.

Digital technology is essential in this process.

KEY PRINCIPLES

visible boundaries

aerial imageries rather than field surveys

accuracy relates to the purpose

opportunities for updating, upgrading and improvement

(Courtesy: Kadaster International, by Ronald van der Heide)

The purpose of the LAND Partnership ▶ is to implement well-defined practical actions in order to enhance security of rights on land and property worldwide:

• In countries or regions with no proper land administration in place,

the partnership stimulates and initiates developments that are pro poor, 'fit for purpose', and takes in account the aspects of cost, quality and time.

• In countries or regions where land administration is in place (to some extent), product and service development is initiated, allowing for improved performance of governments, NGOs, investments and businesses.

The initiative is aimed at governments that want to implement land administration at a large scale and has four components: identification of needs and action planning, advice and advocacy, capacity development and networking and events. The partnership greatly enhances the ability of Kadaster to take immediate action when parties request support.

MoFA
theme
Food Security

Sustainainable
Development
Goal

2 ZERO HUNGER

Digital
technology
Geodata
(Earth observation,
GPS)
Digital processing,
transmission and
storage of data

Country or region
> 20 countries in Africa,
Asia and Latin America

Lead implementing
organisation
Kadaster
International

Achievements and added value

When using fit-for-purpose land administration costs can be kept below €10 per parcel and considerable time is saved.
Costs of classical land registration can be as high as €300 to €400 per parcel.

Digital technology facilitates inclusiveness: citizens participate in the registration process.

The types of digital technology used include GPS, aerial photographs and satellite imagery (determining general boundaries instead of fixed boundaries) and data processing and storage to establish a digital spatial framework. Although applications are tailor-made, they can be reproduced easily.

Fit-for-purpose land administration is very scalable: in Rwanda, more than 10 million parcels have been registered with this method and more than 7 million people received a land use certificate.

"Scaling forward" - going from a simple system to a complex system - is just as important. A fully compliant system needs to be sustained and have the capacity to register modifications, such as land sales.

Having funds readily available means that no momentum and capacity is lost. Being able to act immediately has meant a great deal in achieving results and securing follow-up funds. A well-designed land administration system supports good governance and increases tax income. It also provides a safeguard for refugees: if they have a registered property in their home country, it will be easier for them to return home, as this registration reduces the risk of others occupying their land.

Key challenges and solutions

• An appropriately functioning land administration system is a necessary condition for poverty reduction and contributes to safeguarding human rights.

However, any such system contains data that needs to be protected and/or their use restricted, in view of privacy considerations and possible manipulation.

• A paradigm shift in the attitude towards land administration is required. An appropriate legal and institutional framework is needed for proper acceptance of the digital technology.

People need to be trained in the new approach and digital processing of data.

• Customary and women's land rights need to be treated with special care. A special approach has been developed to do this: the social tenure domain model (STDM).

VIDEOs
Fit-for-purpose pilot in Brazil
Land rights for all

Project: Plantwise

Provide farmers with the knowledge they need to lose less of what they grow, and to feed more

The Plantwise programme ▶ aims at increasing food security and improving rural livelihoods by reducing crop losses.

A main cause of crop losses are plant health problems. Working closely with national agricultural advisory services, CABI establishes and supports sustainable networks of plant clinics, run by trained plant doctors, where farmers can find practical plant health advice.

Plant clinics are reinforced by the Plantwise Knowledge Bank, a gateway to practical online and offline plant health information, including diagnostic resources, best-practice pest management advice and plant clinic data analysis for targeted crop protection.

The plant doctors are mostly government extension workers. At the plant clinics, farmers present a

sample of their crop.
A diagnosis is made and advice is given, based on more than 10,000 factsheets available in the Plantwise Knowledge System.

(Courtesy: CABI)

The data that result from a farmer's visit to a plant doctor are entered into the Plantwise online data management system (POMS) using a tablet. Extension material can be directly downloaded with the factsheet app on a tablet or smartphone.

Cases of difficult to diagnose plant health problems can be analysed in the CABI lab in the UK.

The over 10,000 factsheets available on the Plantwise Knowledge Bank are free of charge. They have been produced by in-country and international partners of Plantwise.

The factsheets are short, practical guides which can be taken offline and into the farmer's field.

Factsheets include Pest Management Decision Guides, which describe safe and effective options for fighting pests and reducing harmful risks of pesticides.

To quickly find the right answer to a plant health problem, users can search by crop, pest, country or region, and even by climate zone.

Achievements and added value

The combination of working with tablets, the digital database and the (digital and downloadable) factsheets makes it possible to reach a large number of farmers in many countries. By the end of 2018, the programme had reached an estimated 31 million resource-poor farmers directly with plant health messages: 10% through plant clinics, 4% through plant health rallies and other face-to-face activities, and 86% through mass extension campaigns.

Globally, women were responsible for 32% of the queries at plant clinics in the period 2012 - 2018, and female attendance of plant clinics is increasing in some countries. The Plantwise Knowledge Bank, which provides free, online and offline technical information on plant health, has been used by over 1.9 million people since 2011 (almost half from Plantwise countries), a high percentage of whom were women and youth.

The interaction with farmers through plant clinics was widely viewed as helpful in addressing farmers' needs concerning plant health. Plant clinics were mentioned as the primary way of identifying pests and diseases.

Plant clinic activities have become a regular part of government activities in the countries where the programme is implemented.

Key challenges and solutions

• Cooperation with government agencies as the main actors responsible for agricultural extension requires a long-term approach. In principle, the government funds the extension activities and CABI provides the knowledge and the digital infrastructure.

To do this successfully, continuing programme investments by local governments and others are needed.

• More attention is needed for climate-smart advice and the application of biological or less damaging pesticides. Consumers are increasingly concerned about pesticide residues in food. This also requires additional budget.

• CABI has existed for more than 100 years and receives part of its income from member countries, who pay a small contribution. For its continuity, CABI relies on a programme funding of £7 to 8 million per year, of which €1 to 3 million comes from the Dutch Ministry of Foreign Affairs.

Continued effort is needed to step up and scale the Plantwise approach beyond government extension so that more smallholder farmers can lose less of what they grow. There is also still a need for mechanisms to ensure uptake of lower-risk pest management solutions.

VIDEOs
Introduction to PLANTWISE
Noorjahan, a Bangladeshi plant doctor

MoFA theme
Food Security

Sustainainable Development Goal

2 ZERO HUNGER

Digital technology
Digital processing, transmission and storage of Geodata (Earth observation)
Mobile phone technology

Country or region
Mali

Lead implementing organisation
Netherlands Development Organisation
SNV, Mali

Project: STAMP
(Sustainable Technology Adaptation for Mali's Pastoralists)

Making pastoralists climate-resilient with satellite data

The aim of STAMP ▶ is to improve resilience among climate affected pastoralists, through access to and use of geo-satellite derived data. This will result in an information service tailor-made to pastoralists' information and decision making needs, giving them more predictability for their movements. STAMP targets pastoralists and agro-pastoralists in the Gao and Menaka regions of Mali.

Traditionally, pastoralists have always sent out scouts in search of water and pastures. Due to climate change and insecurity, however, their movements have become uncertain, expensive and risky. The availability of geodata has come to offer great opportunities for these pastoralist groups.

Satellites can detect biomass and surface water with an accuracy of 10 meters. The STAMP service enables

(Courtesy: STAMP)

pastoralists to use simple mobile phones to call operators or send a text message to instantly obtain information on biomass quality and availability, surface water availability, herd concentration, and market prices for livestock and staple grains along the different transhumance routes.

Achievements and added value

In the 14 months since its commercial launch in November 2017, the Garbal service had registered more than 1,307 calls and 84,816 USSD requests from 55,821 users, which proves its active use. Customer satisfaction is over 90%,

MoFA theme
Food Security

Sustainainable Development Goal

2 ZERO HUNGER

Digital technology
Digital processing, transmission and storage of Geodata (Earth observation)
Mobile phone technology

Country or region
Mali

Lead implementing organisation
Netherlands Development Organisation SNV, Mali

calculated on the basis of feedback from focus groups and call operators who ask to rate the service.

Satellite imagery available through the Copernicus programme, which is freely available and has a relatively high accuracy, has significantly contributed to making the delivery of this service possible.

The application reduces livestock mortality, improves livestock productivity and increases income.

The use of traditional knowledge is a central component of the initiative: pastoralists take their own decisions based on the location-specific information that is provided, no advice is given to them on where to migrate. Pastoralists know how to find the optimum balance between the scarce natural resources and livestock needs. This ensures sustainability and increases climate resilience.

In 2017, STAMP was awarded with the 1st national prize of Orange Social Venture Prize. Acknowledged as an innovation in the fight against

climate change, it has also been referenced by the United Nations Environment Program (UNEP).

Key challenges and solutions

• The application is adaptable to local circumstances.
Strong strategic partners, such as the communications company Orange Mali in the case of STAMP, are essential for success.
Orange is very well aware of the economic opportunities and social value that the initiative provides.

However, without the support of the G4AW Facility ▶ the initiative would not have been realised in this fragile context, because the investment risk is too high.

• The service is complementary to, and an extension of, traditional knowledge: the information on biomass quality, herd concentration and market prices is collected on the ground.

That pastoralists move to where the network is, proves that the service is providing added value.

The limited network coverage in Mali was considered one of the major challenges that the project had to overcome for scaling up.

• In a follow-up phase of the project that includes expansion to other areas in Mali, the government will play a bigger and more official role.

This should enhance the credibility of the service. The Malian ministries of digital economy and livestock are represented in the steering committee. Efforts are made to demonstrate how the use of the service impacts the profitability of telecom antennas in remote places, as an incentive for investment.

New elements will be added to the service, such as financial products and advice on livestock management and health.

VIDEO
The Garbal service

MoFA
theme
Food Security

Sustainainable
Development
Goal

2 ZERO
HUNGER

Digital
technology
Digital processing,
transmission and
storage of Geodata
(Earth observation)
Mobile phone
technology

Country or region
Uganda

Lead implementing
organisation
Technical Centre
for Agricultural and Rural
Cooperation (CTA)

Project: MUIIS
(Market-led User-owned ICT4Ag-enabled Information Service)

Mobilising cooperatives and farmer organisations for ICT-enabled agribusiness

MUIIS ▶ aims at establishing a demand-driven, market-led, and user-owned extension and advisory service, using satellite-based information services:
• weather forecasting and alerts
• crop management and agronomic tips
• financial services, including index-based insurance

The intended users are Ugandan smallholder farmers that grow maize, soy bean, sesame and cow pea.

Crucially important in the mix of actors are the MUIIS Service Agents (MSAs), who have been equipped with smartphones and trained in collecting baseline data, profiling farmers, marketing the information products, and interpreting these for the farmers. The MSAs are generally members of cooperatives, farmer unions, or NGO or government extension staff, and often they themselves are farmers. The incentives earned from profiling not only strengthen their experience in agricultural advisory, but also help them earn an extra income and improve their own farm activities.

The MSAs serve as a human interface to the technology. Part of their role is to train farmer champions, lead farmers, who in turn provide training to fellow farmers. The MSAs also provide technical backstopping to the farmers on how to read and interpret the SMS messages, and actively promote the services to farmer organisations, input suppliers, NGOs and the farmers themselves.

The MUIIS information products are broken down into pre-season (preparation for the cropping season), in-season (weather and agronomic advice) and postharvest (harvest and storage) alerts, accompanied by recommended action. Other alerts that are sent concern the customer's insurance policy.

To receive the bundled MUIIS services, farmers pay a service fee of 14,000 UGX (€ 3-4) per season per acre per crop, to cover the cost of SMS alerts and insure their plot. Additional coverage is available for 10,000 UGX (€2.25) per acre, up to a maximum of 5 acres.
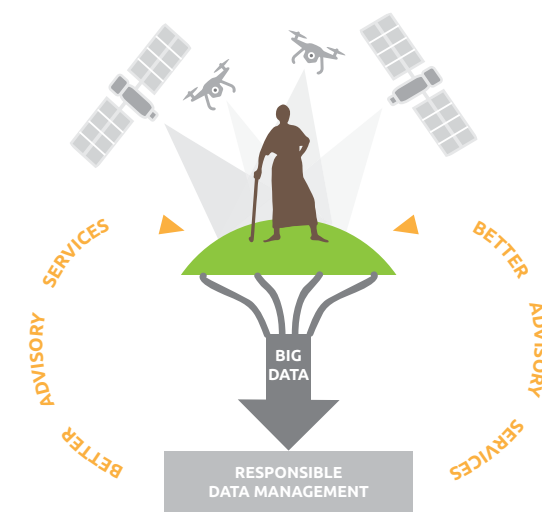
MUIIS

MoFA
theme
Food Security

Sustainainable
Development
Goal

2 ZERO HUNGER

Digital
technology
Digital processing,
transmission and
storage of Geodata
(Earth observation)
Mobile phone
technology

Country or region
Uganda

Lead implementing
organisation
Technical Centre
for Agricultural and Rural
Cooperation (CTA)

Achievements and added value

A very good and robust advisory system has been developed that provides relevant agricultural advice to farmers, making use of digital technology: platforms, databases, modelling and text messages to reach the target group.

By offering low cost bundled information products via electronic platforms, productivity and income is increased and fewer inputs are needed.

The services on offer are based on satellite data, which enables relevant, customised and timely delivery of content to farmers.

More than 250,000 farmers have been reached directly (of whom 50% women and 35% under-35 year olds). More than 2,000,000 farmers have been informed about the service.

The application is adaptable to local circumstances and the technical potential for scaling up is therefore very promising.

Key challenges and solutions

• Although the service demonstrably improves production and productivity, it is difficult to find sufficient paying customers. Farmers are not easily convinced of the added value of the advice. Input providers and insurers have shown interest and cooperation with mobile network operators is explored.
The number of registered farmers is still well below the desired target of 350,000. The number of paying farmers was about 3,600 during the project period and has increased to over 7,000 in the first season of 2019 (business period after the end of the project).

On-the-ground service agents are still needed.

• There are many comparatively small local players in the agricultural value chain in Uganda. They have not seen the value of big data utilisation for their business, hence complicating the Business-to-Business (B2B) opportunity.

Efforts to tie agricultural advice to delivery of financial services require more time to develop. Savings and Credit Cooperative Societies (SACCOs) are now identified as partners for both B2B (e.g. aggregators) and B2C (i.e. farmers) sales. For each market segment a special interface will be developed.

• Linking with other types of services (financial, insurance, market info) can make the initiative more sustainable. Including advice on climate resilience is also an option (e.g. in relation to insurance) that will be explored. The necessary data and models are available.

VIDEO
MUIIS Service Bundel

Health

MoFA theme
Health

Sustainable Development Goal

Digital technology
Digital platform for data exchange and virtual reward payments
Customised apps
Real-time data analysis

Country or region
Kenya, India, Democratic Republic of Congo, Cameroon

Lead implementing organisation
Triggerise

Project: The Tiko ecosystem

Motivating teenagers to make positive SRH choices

The Tiko system designed by social enterprise Triggerise ▶ rewards young people for positive health-seeking behaviour.

Tiko are virtual reward points that can be earned, for instance, when a teenage girl renews her contraceptives or when a pregnant young woman goes for an antenatal check-up.
They can spend their Tiko points like real money on the local market. Accounts are settled virtually and instantly.

Tiko creates an ecosystem that links young people to clinics and hospitals, as well as to local shops, pharmacies and even beauty salons.

To participate, no bank account or internet is needed. Transactions can be done through free-to-user SMS or missed calls on a basic phone, or using an app on a smartphone.

The Tiko ecosystem is rolled out in two strategic partnerships ('Jeune S3' and 'Ignite') between the Dutch MoFA, Cordaid, PSI, Triggerise and other agencies.

These partnerships aim to empower young people to make free and informed choices about their sexual and reproductive health, and to ensure that their SRH rights are respected by increasing access to contraceptives and safe abortion.

Achievements and added value

Of the four countries where Triggerise piloted its Tiko system since 2016, Kenya shows the fastest uptake with 161,914 'active members' in 2018 (see graph).

In Kenya, Triggerise provided 143,425 Couple-years of protection (CYP), which estimates the protection from pregnancy provided by all contraceptive methods during a one-year period.

	Kenya	India	DRC	Cameroon
2016	2	970	17	0
2017	4,681	29,226	780	0
2018	161,914	32,399	11,733	1,667
Q1 2019	84,072	14,674	1,870	848

Active Tiko members = users who adopted at least one impactful SRH behaviour

MoFA theme
Health

Sustainable Development Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital technology
Digital platform for data exchange and virtual reward payments
Customised apps
Real-time data analysis

Country or region
Kenya, India, Democratic Republic of Congo, Cameroon

Lead implementing organisation
Triggerise

The Tiko system also increases the cost-effectiveness for meeting the contraceptive needs of adolescents. The average cost per user in Africa is $35. In Kenya, Triggerise achieved $27 per user in 2018 and aims to bring this cost down to $18 in 2019.

In addition to encouraging positive SRH behaviour, Tiko injects an alternative, virtual currency into cash-starved markets. Low cash-flow is the greatest barrier to growth in Bottom of the Pyramid markets. Many aid programmes have damaged local markets for impact products such as condoms or mosquito nets.

Triggerise capitalizes on the efficiency of mobile technology to work with existing shopkeepers, informal traders, local distributors and wholesalers, instead of imposing a parallel supply chain network. In India, women can become Tiko PRO micro-entrepreneurs, selling health and family planning products as last-mile distributors.

The real-time data collection of all interactions and transactions provides unique insights into consumer behaviour, the effects of subsidies on uptake of treatment, and the efficiency of health service delivery.

Fraud is quickly detected, for instance by sudden spikes in services offered. The real-time data can also be integrated into the monitoring efforts of other projects and used to adjust strategies quickly.

Key challenges and solutions

- Triggerise complies with the GDPR. To maximise member privacy, only data that is relevant to achieve project goals is collected. Gender and year of birth are registered because they determine the type and cost of health services offered; names and dates of birth are irrelevant data and therefore not collected.

- Due to taboos surrounding sexuality and pre-marital sex, some teenage girls fear being stigmatised if they become Tiko members. Triggerise therefore added non-SRHR offers such as paid visits to a beauty salon.

- The fast-evolving mobile phone user habits of teenagers present an ongoing challenge. Research in Kenya showed that teenagers don't download the Tiko app if, given their phones' limited GB, this competes with popular apps such as SnapChat. In response, Triggerise partnered with existing messaging services such as Facebook or Telegram.

Another example is that when Triggerise started seven years ago, a SIM card was a valued asset that people held on to. This prompted Triggerise to use phone numbers as the unique identifiers for their members. Today, SIM cards have become disposable items, which are distributed for free with telecom marketing offers. This change is forcing Triggerise to explore new identification methods.

VIDEO
The Tiko Companion

MoFA
theme
Health

Sustainainable
Development
Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital
technology
Diagnostic
imaging techniques
E-health software
Machine learning
Artificial intelligence

Country or region
Global
> 30 countries

Lead implementing
organisation
Delft Imaging
Systems B.V.

Project: CAD4TB
(Computer-Aided Detection for Tuberculosis)

Solving the TB detection challenge
through low-cost digital X-rays and smart software

Tuberculosis (TB) is the deadliest infectious disease and a leading cause of death for HIV-positive people. Of the 1.6 million people who died of TB in 2017, 300,000 were HIV-positive. The lack of effective and inexpensive ways to detect new TB cases at an early stage has long obstructed the fight against TB in South-East Asia and Africa, where TB prevalence is the highest. Around 2010, digital X-ray machines entered the market, replacing conventional film radiography. This offered new opportunities.

(Courtesy: Delft Imaging Systems)

Most developing countries, however, lack radiologists who can accurately read the digital X-rays on the presence of TB. The Dutch company Delft Imaging Systems ▶, together with Radboud University Nijmegen, developed software (CAD4TB) that resolves this problem. Within 15 seconds, the software analyses a chest X-ray, detects abnormalities and indicates the likelihood that active TB is present with a score between 0 and 100. To achieve this, machine learning was applied to thousands of healthy and diseased X-ray images from over 15 countries. Currently, artificial intelligence based on deep-learning is used to enhance the accuracy and reliability of the system and to provide new features, such as the ability to process images of children as young as 4 years old.

The development of CAD4TB was made possible by a subsidy from the Life Sciences & Health for Development fund, managed by The Netherlands Enterprise Agency (RVO).

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MoFA
theme
Health

Sustainainable
Development
Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital
technology
Diagnostic
imaging techniques
E-health software
Machine learning
Artificial intelligence

Country or region
Global
> 30 countries

Lead implementing
organisation
Delft Imaging
Systems B.V.

Achievements and added value

The CAD4TB solution is designed specifically for developing countries: it is easy to implement, and results come back instantly, which significantly reduces the time-to-diagnose. If diagnosed in time, TB is generally curable within 6 months.

In addition, CAD4TB reduces the cost of large-scale TB screening from $12 to less than a few dollars per person. This is because only people whose X-rays indicate potential infection with TB need to undergo a sputum test (e.g. GeneXpert MTB-RIF) to finalise the diagnosis and establish the type of TB they suffer from. These sputum tests are expensive, more time consuming, and difficult for most children to perform.

Since the start of CAD4TB in 2011, over 3 million people have been screened. The solution has been installed in more than 200 sites. To enable TB screening in remote areas, the OneStopTB Clinic ▶ was developed. It is built into a 20ft container that can travel to the most remote or high-risk areas such as slums, mines or prisons. Where no grid electricity is available, 300 patients can still be screened per day thanks to the solar panels on the roof. More than 30 mobile OneStopTB clinics are visiting communities worldwide. Ghana has more than 30 stationary OneStopTB clinics.

CAD4TB was the first digital TB detection solution worldwide. The Global Fund and other public and private donors invest in its distribution. X-ray companies such as Philips are now also implementing the CAD4TB solution in their X-ray portfolio.

Key challenges and solutions

- The CAD4TB software can be installed on a PC next to the digital X-ray machine. To prevent the risk of losing data (e.g. by theft or hardware failures) and to improve data security, a Cloud solution was also developed. Anonymised X-ray images are sent from the machine to the Cloud, which sends back results within seconds.

- The introduction of the CAD4TB solution requires some training of health providers as well as changes in diagnostic protocols at clinics and hospitals. The Dutch MoFA has commissioned the World Health Organization (WHO) to roll out a capacity building programme for this purpose.

VIDEO
Delft OneStopTB mobile clinic

MoFA
theme
Health

Sustainainable
Development
Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital
technology
Mobile health
payment and
data exchange platform
mHealth wallet
Real-time information
dashboards

Country or region
Kenya, Nigeria, Tanzania

Lead implementing
organisation
CarePay Kenya

Project: M-TIBA

Making healthcare more inclusive with a mobile Health Wallet

M-TIBA is a personal mobile phone-based mHealth Wallet. Individuals can use M-TIBA to get insured, save money for themselves, or pay for their own or their family's healthcare at clinics connected to the M-TIBA platform. These clinics can bill their patients on a tablet that is connected to the platform, and register and receive claims payments quickly. M-TIBA helps clinics to monitor their finances, to track their patients and provide disease management. Governments and donors can deposit funds directly in the mHealth Wallets at very low marginal costs. This enables them to reach the most vulnerable people, who normally depend on out-of-pocket payments for care, in a direct and transparent way.

M-TIBA's main goals are to improve health care inclusion, reduce unnecessary administration and overhead costs, and create transparency about the cost and quality levels of healthcare. The platform was launched in Kenya in June 2016 by the social enterprise CarePay Kenya ▶, in partnership with the PharmAccess Group ▶ (which manages the Dutch MoFA's investment in CarePay) and Kenya's leading communications company Safaricom.

Achievements & added value

In three years' time, more than 4.5 million Kenyans have signed up for the service. This success is related to the fact that M-TIBA is built on M-PESA, the widely-used mobile phone-based payment system that was pioneered by Safaricom. The Kenyan government through its

(Courtesy: CarePay)

M-TIBA

MoFA theme
Health

Sustainainable Development Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital technology
Mobile health payment and data exchange platform
mHealth wallet
Real-time information dashboards

Country or region
Kenya, Nigeria, Tanzania

Lead implementing organisation
CarePay Kenya

National Hospital Insurance Fund has started cooperating with CarePay, in partnership with PharmAccess, in the roll-out of its Universal Health Coverage (UHC) pilot, emphasising that M-TIBA is instrumental for reaching low-income groups fast and efficiently.

M-TIBA puts the patient, however poor or excluded, in charge by giving him or her direct control over their own health entitlements in their mHealth Wallet. This changes the way individuals and healthcare providers interact and is an incentive for clinics to provide quality care to everyone, regardless of their income.

The number of digital applications for the medical sector is growing fast, also in Africa. Most of these apps focus on the medical side of the healthcare process (telemedicine, task shifting, etc.) and largely ignore the financial side. In Kenya around US$ 3 billion is spent annually on healthcare, paid by the government, donors, private and public insurance agencies, and patients. The M-TIBA platform is built in such a way that

(Courtesy: CarePay)

all these payment channels can make use of the same back-end infrastructure as well as the same mHealth Wallet. This ground-breaking efficiency as well as the empowerment of the individual has resulted in recognition for M-TIBA all over the world.

CarePay has received awards by the Financial Times / IFC (2017), the World Economic Forum (2018),

and in May 2019 Swiss Re Foundation awarded CarePay with the first prize in its global 'Entrepreneurs for Resilience' Award.

The fact that the M-TIBA platform technology can integrate with any digital payment system in a country, makes it possible to link up different services.

Several innovations by PharmAccess

MoFA theme
Health

Sustainainable Development Goal

3 GOOD HEALTH AND WELL-BEING

5 GENDER EQUALITY

Digital technology
Mobile health payment and data exchange platform mHealth wallet Real-time information dashboards

Country or region
Kenya, Nigeria, Tanzania

Lead implementing organisation
CarePay Kenya

are already running on the M-TIBA platform. This includes SafeCare ▶, to improve the delivery of safe and quality care according to internationally accredited standards, and Cash Advance ▶, a short-term loan facility offered through M-TIBA by PharmAccess' Medical Credit Fund that uses the digital revenues of health care providers to secure and repay relatively small loans.

The constant digital data collection offers completely new opportunities for social impact in public health. Currently on every fifth day of the month in Nyeri County in Kenya, all hospitals close their doors to be able to copy the relevant hand-written clinical information by hand into books that by the end of the day are trucked to the Ministry of Health in Nairobi. There the information is entered into the government database system, again all manually.

The M-TIBA platform, on the contrary, powers dashboards that provide real-time updates on the main diagnosis and healthcare services provided to M-TIBA users at all connected clinics. Soon, an epidemic such as Ebola could thus be located at as soon as it emerges.

Equally significant is that insurance companies, who have traditionally refused to include the low and middle income groups in their insurance schemes because of a lack of data on their health situation, are becoming less hesitant to do so because of the objective information that M-TIBA collects.

Key challenges & solutions

- The future social impact of M-TIBA depends on the possibility to scale the intervention and thus to obtain large volumes of data from hospitals and clinics all over a country. Technical and infrastructure challenges include limited network connectivity or mobile phone penetration in remote areas, but also the legacy systems of Ministries of Health and large hospitals that need to be connected to the M-TIBA platform.

- When these systems are non-existent, the roll-out is much

easier. This is the situation with a project that CarePay has just started in Nigeria. The Lagos State health insurance agency, which became operational only a year ago, is introducing a mandatory health insurance scheme for the entire state population of 23 million. CarePay has been commissioned to implement the full process: from registering customers, to collecting medical and financial data, and taking care of the payments (collecting insurance premiums as well as payments to care providers). Being involved from scratch in such a mega-project offers unique opportunities for realising M-TIBA's envisioned social impact.

Human Rights

Project: IIIM
(International, Impartial and Independent Mechanism)

A balancing act of people, processes and technology

Since the start of the 2011 uprising and the following violent conflict in Syria, atrocities have been committed by all sides. To be able to bring justice to the victims of these crimes in the future, the UN General Assembly established the International, Impartial and Independent Mechanism (IIIM). Its mandate is to collect and analyse information about, and evidence of, the most serious crimes under international law and the persons responsible for these crimes.

The Mechanism was created to function as a central repository for the voluminous information and evidence of those crimes from arguably the most extensively documented conflict in history.

Through its mandate, the Mechanism can assist criminal proceedings in national, regional or international courts or tribunals that have, or may

in the future gain, jurisdiction over these crimes.

Because the conflict is ongoing, the conventional model for collecting, preserving and analysing evidence does not apply. IIIM does not have access to the country and moreover, a great deal of the relevant information and data are digital. This requires new skills and approaches to capture, preserve and log the evidence according to the highest professional standards.

IIIM has introduced a unique structure that allows capturing, storing and analysing millions of text files, videos, audio recordings, photographs and other files in digital formats.

(Courtesy: United Nations)

Achievements & added value

The IIIM consolidates and preserves data, links evidentiary pieces to establish individual criminal responsibility, and carries out targeted investigations to fill gaps in the evidence gathered by others.

The IIIM started off building an eco-system of the right experts and processes to enable technology to thrive. An information systems management section was created, consisting of specialists in e-discovery, data protection and security and information technology, which is at equal footing with the

MoFA
theme
Human Rights

Sustainainable
Development
Goal

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Digital
technology
Digital processing,
storage, analysis and
sharing of data
Machine learning

Country or region
Syria

Lead implementing
organisation
United Nations

analysis section consisting of criminal justice experts.

Digital approaches and solutions were introduced for:

- Preservation and logging:
  In international criminal proceedings it is vital to prove that evidence has not been tampered with. IIIM has developed a secure evidence management system to document and preserve the evidence collected. It enables the processing and storage of digital files and the adding of comments to these files. Digital fingerprints are taken to ensure that the original file can be identified at a later stage. However, digital cages are vulnerable and can be hacked. The IIIM system is built in such a way that it is auditable. All data can be subjected to independent verification to establish the origin of the information, where it went, and who touched it.

- Analysis & digitalisation:
  The Mechanism has over a million of documents on file. No team of lawyers will be able to go through

these documents carefully and code and analyse them manually within a reasonable timespan. Therefore, IIIM has introduced machine learning and evidence-processing services, which allow the system to read through the documents and flexibly categorise them so that they can be searched and adjusted to fit multiple jurisdictional requirements. Emerging technology is enabling 'bulk sorting' of videos and audio files without human involvement.

- Sharing:
  Digitalising information makes it possible for the Mechanism to share evidence with prosecutors and tribunals. Before case files had to be typed up, boxed and shipped. But the amount of data that is collected nowadays (including video and audio files and email communication) requires a different approach. IIIM introduced a system that enables the safe and secure sharing of large volumes of digital information. A challenge is the lack of complementary sharing system at the receiving end.

Key challenges and solutions

- To ensure the successful introduction of new digital technologies, organisations need "translators" who speak both the language of tech and the language of law and policy. IIIM made sure to have such people on board from the very start.

- Finding the most appropriate and effective cyber security measures and information governance system that will fully cover the risks of data loss or leakage, is an ongoing endeavour.

- The advanced tech processes of the IIIM, and experts needed to design and manage these processes, are costly. Moreover, given the fast advances in software and technology, future needs and costs are often hard to predict. This conflicts with the requirements of many funding agencies, which expect organisations to identify anticipated expenditures up front.

Project: SPEAK

Strengthening women's advocacy for better public services

5 GENDER EQUALITY

The quality and quantity of public health and education services impact the opportunities of poor women in Indonesia to improve their livelihoods. However, women have very little influence on the budgeting, procurement and implementation of public services. In fact, these local government processes are prone to bad planning, lack of public participation and oversight, and corruption.

Hivos and its Indonesian partners are therefore building the capacity of local CSOs and women's groups to advocate for gender-responsive budgets and to monitor the implementation of health and education services.

This is done at sub-national level in Bojonegoro regency (East Java) and Semarang city (Central Java). First, the women's groups are trained to better understand complicated

government budgets and to lodge complaints through digital platforms: LAPOR Hendi ▶ (for Semarang) and Bojonegoro Open System ▶.

Secondly, a network of female social auditors is trained to monitor the complaints handling by the government and the implementation of specific services.

This civic participation is meant to improve transparency and accountability and make public service delivery more inclusive and responsive to the needs of people, particularly woman.

The 4-year project SPEAK ▶ started in 2018 and is co-funded by the Dutch MoFA and the European Commission. The same Indonesian partners are also involved in the Strategic Partnership programme 'Open Up Contracting' ▶.

LAPOR SEMARANG

#LAPORHENDI

Achievements and added value

The LAPOR Hendi portal and Android app make it easier for citizens to lodge complaints about planning, procurement and implementation of public services.

It takes away practical (time and distance) barriers to being seen by a local government official, but also responds to the cultural barriers of a patriarchal and hierarchical society that rarely permits women to be involved in politics, let alone openly question the authorities.

Any citizen can log on to the user-friendly portal through the website or by SMS and a range of social media such as Facebook, Twitter or Telegram. One can choose who to report to - for instance the mayor, governor, or anti-corruption commission - and photos and documents can be uploaded to substantiate the complaint.

Complainants should receive a response within 5 days, and the reported issue must be addressed or resolved within 30 days.

The training of the women's groups has started and the first complaints have been successfully lodged and dealt with. The instrument is hoped to contribute to rebuilding the broken trust between the local government and citizens.
It is encouraging that the mayor of Semarang has been very supportive of the project.

The project will build a network of 240 women to be involved in social auditing. They will represent 550,000 economically marginalised men and women in Semarang and Bojonegoro.

Key challenges and solutions

• The LAPOR Hendi portal managed by the Local Government of Semarang City is connected to the national platform LAPOR!
Upscaling the intervention to connect other cities and provinces is technically possible and proven.

A challenge, however, is the quality and presentation of government data that are made public.

Currently, the datasets are still limited and hard to understand, and therefore difficult to use for advocacy by ordinary citizens.

• Secondly, empowering women to speak out is not without risks.
The Indonesian Law on Electronic Information and Transactions (2008) allows for criminal sanctions for 'defamation on the internet', with up to 12 years of imprisonment. This makes people very hesitant about voicing complaints on online fora.
It is therefore crucial that the privacy of people using LAPOR Hendi is safeguarded. In line with the 'whistleblowing mechanism', persons interacting with the platform can choose not to disclose their identity.

The women's groups are also trained on the importance of submitting all the necessary documents and data with their complaints to avoid being charged with a defamation lawsuit, or otherwise facing retaliation from government or private sector actors.

MoFA
theme
Human Rights

Sustainable
Development
Goal

4 QUALITY EDUCATION

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Digital
technology
Digital security tools

Country or region
Global

Lead implementing
organisation
Access Now

Project: Digital Security Helpline

First responder services in a digital security eco-system

Space for civil society is shrinking: individuals and organisations are increasingly being restricted and criminalised when speaking out for their rights or against the authorities. In a world that is increasingly digitalised, the online environment is being attacked just as much. Platform accounts (e.g. FaceBook or Twitter) are being hacked, popular websites are facing DDoS attacks around election times, and malware and spyware are being used against individuals and organisations to track, monitor and disavow their communications.

To address these increasing attacks on civil society from a technology perspective, Access Now ▶ has introduced the Digital Security Helpline ▶.

The Helpline is run by a globally distributed team that provides 24/7 emergency incident response, digital

(Courtesy: Access Now)

security advice, and implementation support for civil society around the world. The Helpline offers real-time, direct technical assistance and advice to civil society groups and activists, media organisations, journalists and bloggers, and human rights defenders.

The resource is free-of-charge and

has people on-call across multiple time zones (including San Jose, Costa Rica; Berlin, Germany; Tunis, Tunisia; and Manila, the Philippines) to ensure continuous availability. To date, they have dealt with over 4500 unique cases and have 270 practical tools in their knowledge management database, ready to be employed in support of users at risk.

MoFA
theme
Human Rights

Sustainainable
Development
Goal

Digital
technology
Digital security tools

Country or region
Global

Lead implementing
organisation
Access Now

Achievements & added value

The Helpline offers support in protecting communication, securing online accounts and keeping information safe. Human rights defenders, for example, are assisted to securely store evidence or sensitive data and to travel safely.

Whenever the Helpline receives an email or phone call from an individual or organisation in need, Access Now provides assistance through secure communication channels within 2 hours. Providing digital security, however, should happen as part of a larger eco-system. The Helpline's major added value in this ecosystem is its crisis-response service that is available 24/7 and in real-time.

As awareness is growing that digital security should not be considered merely an add-on, but a basic necessity in this digital age, Access Now is also increasingly involved providing preventative technical support. The Helpline walks an organisation through assessing the risks they face in the work they do,

and together they prioritise the digital security needs. Furthermore, the organisation works in collaboration with networks such as the Rapid Response Network (RARENET) ▶, in which NGOs, internet content and service providers, and individuals together contribute time and resources to improve the security awareness of civil society groups.

With their support, Access Now creates and contributes to guides and materials to help communities, organisations and individuals improve their digital security.

Key challenges & solutions

- Asking for help is difficult if you are not aware of the risks or threats you are facing. Many civil society groups and actors are indeed largely unaware of the digital threats they are very likely facing – let alone that they have the resources and skills to deal with them. At the same time, the "opponent" is growing in strength. Many state defense agencies today have a cyber command. Their

fencing capacity is on the rise and in this age of terrorism and counter-terrorism, certain groups are more quickly labelled as opponents that need to be silenced or censored. This increasingly asymmetrical environment requires a strong situational awareness and a better understanding of the vulnerabilities of organisations and individuals.

Access Now calls for more awareness and up-to-date knowledge about the tools and services that an initiative like the Helpline can offer to protect civil society groups against threats to their digital security.

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Humanitarian Assistance

MoFA theme
Humanitarian Assistance

Sustainable Development Goal

1 NO POVERTY

Digital technology
Machine learning
Predictive analytics

Country or region
Global

Lead implementing organisation
OCHA's Centre for Humanitarian Data

Project: OCHA Centre for Humanitarian Data

Catching a signal to anticipate, predict and trigger faster response

There is a global need for better, faster and cheaper responses to humanitarian crises. The Centre for Humanitarian Data, which opened in The Hague in December 2017, aims to increase the use and impact of data in humanitarian response. It is part of the Information Management Branch of United Nations Office for the Coordination of Humanitarian Affairs (OCHA) ▶ and is considered critical to raising the situational awareness of the Office and the wider humanitarian sector about specific humanitarian crises as they emerge.

After setting up the first-of-its-kind Humanitarian Data Exchange (HDX) platform, the Centre made important strides towards improving data availability from many different sources and covering many different crises. However, it soon became clear that making quantities of data available - the HDX currently offers

over 10,000 humanitarian datasets - was not enough. For the sector to become more data-driven, there are challenges that need to be addressed, such as aligning data policy and improving people's data skills. More recently, there has been a focus on developing models that use data to predict what is going to happen, so the humanitarian sector can respond faster to protect and save more lives.

This required a shift towards predictive analytics, which means using current and past data (i.e. HDX data sources) to identify features and their importance for predictions. Data can thus be used to stimulate anticipatory actions that can be taken ahead of imminent crises to try and mitigate the impact of the expected consequences for vulnerable people. The Centre aims to develop new models, or to enhance existing ones, so that

(Courtesy: OCHA)
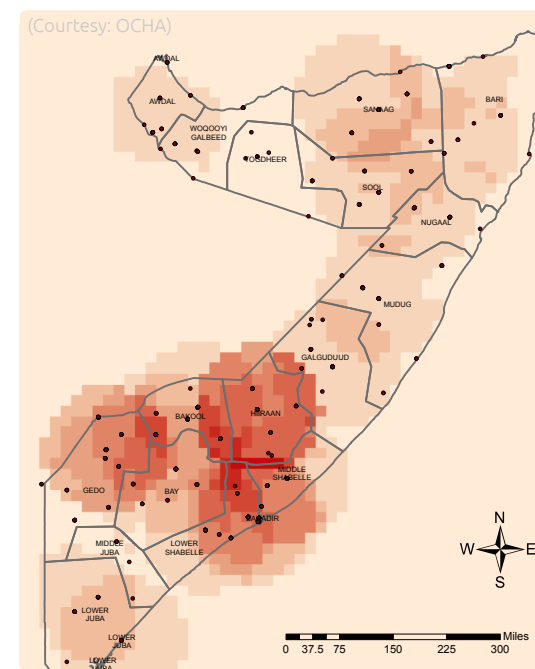
predictions can be made about future events such as increased food insecurity, displacement, disease outbreaks and climate risks. To increase trust in the technical and ethical aspects of modelling, the Centre will offer an objective

peer review process as a service to humanitarian partners and decision makers.

Achievements & added value

The Centre is still developing operational models, but the piloting of different approaches has already been very insightful. One pilot model aimed to predict the amount of funding needed from OCHA-managed pooled funds to de-escalate food insecurity. This work was done in partnership with the World Bank and built on their effort to predict famine risk in several high-risk countries.

The Centre's pilot model was developed in 2018 for Somalia and has now been replicated for South Sudan. Through this pilot model an important question was positively answered: it proved possible to use historical data sets of expenditures in one country or area to anticipate funding needs to prevent humanitarian crises elsewhere. Yet the Centre's ambitions go beyond improving resource efficiencies. Rather, it seeks to develop complex

system models that identify multi-dimensional humanitarian needs including food, water, health, and of people on the move. By creating such models, the OCHA Centre seeks to integrate predictive analytics into existing humanitarian decision-making processes such as the annual Humanitarian Response Plans.

Key challenges & solutions

• The opportunities for applying predictive models in humanitarian crises are plenty, yet there are challenges too. A limited availability of data as well as issues with data quality are among the immediate challenges. The Somalia model, for example, required 800 lines of code, 600 of which were directed towards data cleaning.

• Another issue is readiness: the speed of moving from data collection to the use of data for analysis needs to go up. To realise this, the Centre encourages organisations to work together on standardising methodologies, which will

enhance interoperability of systems and datasets.

• Finally, there are also ethical risks associated with 'humanitarian forecasting' based on historical data. Models may produce a false negative or a false positive, resulting in people in need not receiving assistance or donors providing funds when they aren't needed.

VIDEO
Centre for Humanitarian Data
Opening Event

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MoFA
theme
Humanitarian
Assistance

Sustainainable
Development
Goal

1 NO POVERTY

Digital
technology
Digital financial
database and
data processing

Country or region
Global

Lead implementing
organisation
Stichting Vluchteling /
International Rescue
Committee

Project: SCAN Tool 2.0
(Systematic Cost Analysis Tool)

Improving reach and impact of humanitarian spending

Humanitarian emergencies are happening ever more frequently and growing in scale at a time when resources are increasingly constrained. Existing methods to calculate cost-efficiency in humanitarian assistance are inconsistent, time-consuming and create opportunity for error. Consequently, there is a lack of robust "Value for Money" (VfM) data that can help to understand how the best quality service can be provided to the most people per dollar spent. In response to this, the International Rescue Committee (IRC) designed the multi-agency Systematic Cost Analysis (SCAN) tool, as an effort of a five-party consortium: IRC, Mercy Corps, Acción Contra El Hambre, Save the Children and CARE.

SCAN was initially developed by the IRC as an online tool ▶ dedicated to field staff, to help them quickly and consistently calculate cost per output for an individual activity. The tool allows pulling grant expense data from organisations' finance systems, it helps users evaluate how cost-efficient their programme has been, and how this cost-efficiency compares to other programmes in different contexts. SCAN helps programme staff to answer challenging questions such as "How much does it costs to treat one child for severe acute malnutrition?"

The 2.0 version of the tool, which is funded by the Dutch Relief Alliance Innovation Fund ▶, is meant to offer a consistent methodology and solution that suits the needs of different finance and data security systems of humanitarian NGOs, focusing on three key programme areas: cash, health and education. It will support humanitarian actors to develop and implement programmes that target and deliver funds with greater effectiveness and efficiency.
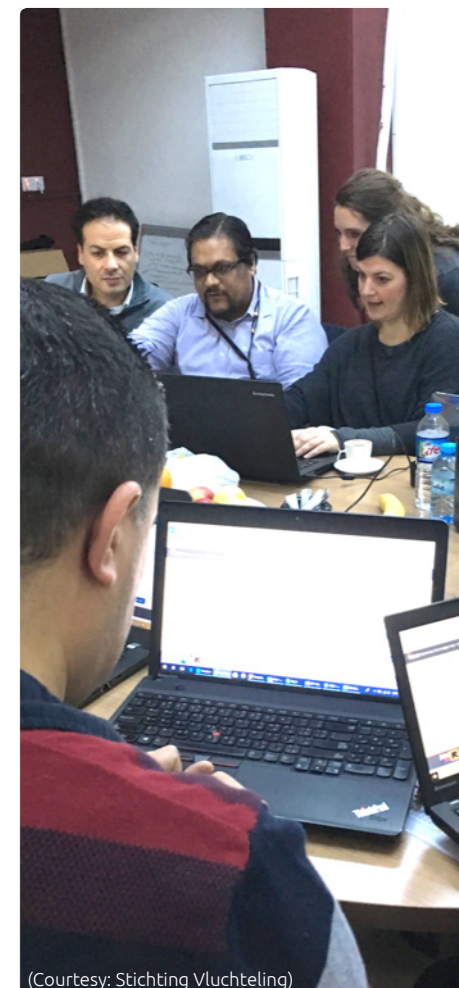
(Courtesy: Stichting Vluchteling)

Achievements & added value

When data is gathered and analysed in a consistent fashion, confidence in the findings flowing from data analysis will grow. SCAN therefore was built to close gaps and resolve inconsistencies in methods and metrics of resource allocation analysis. A great strength of the tool is that it does not require individual organisations to change their existing finance software and approaches. Organisations will need to appoint a dedicated IT person who can develop and implement the script that allows uploading their data to the SCAN tool on a protected server. After that initial IT process is done, deciphering spreadsheets should be a thing of the past.

IRC has rolled out the SCAN tool in its DFID-funded programme 'Cash Consortium for Iraq' (CCI). This programme aims to better meet the needs of conflict-affected households by enhancing the impact of multi-purpose cash assistance. Two SCAN analyses were conducted: one prospective analysis on the budget, and a second analysis of spending patterns 10 months later. This Value for Money analysis allowed to make recommendations on different programme components such as a more efficient delivery mechanisms of the cash programme, speed of delivery of services, staff time required, and trainings.

Key challenges & solutions

• While the IT and technology behind the tool can be rather easily integrated into an organisation's existing systems, the human factor remains a point of attention. Firstly, staff needs to be trained on the use of the tool and on how they can benefit from resource efficiency data.

• Secondly, there are risks associated with the interpretation of the data: having more data out-in-the open without a proper understanding of the data, brings the risk of it being used out of context. Value for Money conversations should therefore be held with staff in order to translate the technical and economic lens of VfM to their practice.

• The consortium has purposely chosen not to use the tool to compare resource data between organisations, until a culture of using and understanding such VfM data becomes more embedded in the sector. To encourage this, the consortium has set up a Donor Advisory Group to initiate a dialogue about learning priorities and reporting requirements in measuring the costs of delivering humanitarian assistance.

How the tool works

1 Create a new analysis
2 Select an output to model from pre-defined list
3 Import necessary cost data from existing systems (automatically or manually)
4 Automatically categorize items based on financial codes (check categorization and exclude unnecessary categories)
5 Link the costs to outputs produced
6 Get results and insights

Project: 510
(The Netherlands Red Cross)

Using data for a positive impact before, during and after a disaster

When a disaster occurs, or is imminent, aid workers on the ground need fast and accurate information to make effective decisions. The use of digital data can play an important role in this. Especially when these data are translated into information products that are easy to understand and used by aid workers, decision-makers and the people affected. In 2016, the Netherlands Red Cross initiated "510" ▶ to provide such data-driven services to all Red Cross National Societies globally.

510 supports data-driven decision-making to improve the speed, quality and cost-effectiveness of humanitarian assistance during 4 phases of a disaster:

1 Disaster preparedness, through digital risk assessment

2 Early warning early action, through predictive impact analytics

3 Disaster response, through emergency data support

4 Support in any phase of a disaster or crisis, through direct digital aid

To facilitate implementation and continual learning, the Red Cross initiative also offers tailored digital transformation services. For this it builds on a broad network of volunteers, both individuals and corporate partners, and a dedicated data team.

1 NO POVERTY

Achievements & added value

Collecting and analysing the data that are needed for well-targeted humanitarian assistance is often a time-consuming process. For example, collecting, collating, managing and visualising data to create useful maps of crisis locations takes time. Often it also requires internet connectivity, which may not be available on the ground. However, for aid workers to respond efficiently before, during and after disaster has struck, it is key that they have information about: Where are the most affected people? How many and which buildings were damaged? How badly? Which roads are accessible? What agricultural land is still viable? 510 coordinates a dedicated team of staff and volunteers who can be quickly activated remotely to create products that provide consistent information to answer such questions.

510 initiated a multi-stakeholder consortium of humanitarian organisations, academic and corporate partners to build 121:

a system that can offer safe, fast and fair 'cash based aid'. 121 is piloting this still somewhat contested form of humanitarian assistance. One of

Examples from the field

- Before typhoon Mangkhut landed in the Philippines in September 2018, 510 supported the Philippine Red Cross with damage predictions based on forecasted wind data, and continued its support 6 hours after the typhoon landed based on actual data. Expected priority areas both before and after landfall were determined, which supported the Red Cross' response to the disaster.

- Also in 2018, Central Kenya was affected by a dam burst causing a flash flood. Due to poor quality maps, aid workers had no idea how many people lived in the area and therefore had difficulty estimating how much help was needed. Together with the Malawi Red Cross Data Team who were training with 510's HQ at the time, 510 created a map that estimated the number of buildings affected, and indicated their original locations.

- Bilateral support also was provided in the aftermath of the hurricane Irma that landed in Sint Maarten in 2017.
  See video ▶

Satellite images and aerial photographs are used as relevant data sources in many of these efforts.

the goals is to leverage the potential for making sure that the donated funds for humanitarian relief as much as possible help the affected

MoFA
theme
Humanitarian
Assistance

Sustainainable
Development
Goal

1 NO
POVERTY

Digital
technology
Geodata
Earth observation
Open data
Drones
Real-time data
analysis

Country or region
Global

Lead implementing
organisation
510 An Initiative of
The Netherlands
Red Cross

persons to meet their own needs. 510 will facilitate discussions about the ethical, regulatory and logistical considerations of this approach in the coming years.

Key challenges & solutions

- Creating scientifically sound methods to help improve humanitarian aid is one thing, but ensuring people use these methods with ease is equally important. 'Traditional' (i.e. non-data driven) humanitarian assistance often leaves little room for affected people to co-develop the humanitarian response. 510 works from the premise that multiple end users should be able to understand and use its information products without additional assistance. 510 therefore embeds human-centred design in its creation processes, ensuring that users are involved in the development of both products and service-delivery methods, from inception to roll-out.

- Another challenge relates to one of the weaknesses of "disaster data",

namely the lack of standardised methodologies and definitions. Fortunately, due to increased pressure for accountability as well as the EU General Data Protection Regulation, many donors, development agencies and humanitarian relief organisations have started placing requirements on data collection and its methodologies. In this process, data verification is essential.

To verify the data collection and analysis process, 510 asks 4 leading questions: (1) Is the data authentic? (2) Who published the data and where is it stored? (3) When was the data published? and (4) From where is the data uploaded when smart phones are used? By critically examining datasets and collection methods, more trustworthy and accurate results are generated for

predicting and assessing disaster impacts.

- Finally, the use of data may in some cases have negative consequences for vulnerable people. In such instances, measures must be taken to avoid putting them at risk. Assessing the benefits of data-driven solutions versus their potential harm, thus requires awareness about how to use innovative data technology and (open) data in a responsible way. That is why 510 set up a Data Responsibility Policy run by a multidisciplinary project team. According to 510, not only internal staff, but also funding agencies and policy-makers can benefit from a stronger digital literacy to help them assess both the potential and pitfalls of digital-driven approaches for the humanitarian sector.

Private Sector Development
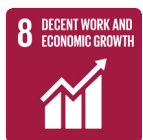
Project: liwwa

Tech-enabled lending to SMEs provides jobs and income in Jordan

In Jordan, small and medium-sized enterprises (SMEs) employ up to 65% of the labour force. However, 3 out of 4 of these enterprises have difficulty accessing finance. Their financing needs are higher than what is provided by microfinance institutions, but they do not fulfil the requirements of traditional banks due to their shortage of credit histories and collateral, as well as the high transactions costs.

In 2015, liwwa ▶ was founded as one of the very first tech-oriented lenders for SMEs in Jordan. By using smart digital technologies for credit analysis and rating, as well as an online lending platform, liwwa can offer affordable, collateral-free loans to SMEs. The loans, used for trade, working capital or asset financing, are issued in local currency equivalent to US$ 7,000 to 100,000.

The Ministry of Foreign Affairs has supported liwwa with debt capital through the Dutch Good Growth Fund (DGGF) managed by Triple Jump and PricewaterhouseCoopers, and The Netherlands Development Finance Company (FMO).

Achievements and added value

liwwa has been growing fast in the past few years. 2018 saw an 80% increase in lending. By the end of Q1 2019, the company had underwritten over $21 million across 514 loans. liwwa's mission is to contribute to job and income growth in Jordan, and soon in Egypt.

Economic modelling shows that in 2018 liwwa supported 637 jobs, generated $2.3 million in income for Jordanians and $15.4 million in output to the Jordanian economy. On all fronts this was a nearly 100% increase compared to 2017. The loans serve SMEs in a wide range of

(Courtesy: liwwa)

sectors, topped by food & beverages (16%), pharmaceuticals (12%), and construction (7%).

For borrowers, liwwa's major added value is its high speed of service: credit decisions can be made and funds disbursed within 24 to 48 hours of receiving a loan application. To originate a loan liwwa sales staff meet the SME owner at his or her premises and enter some key data into the credit analytics programme on their tablets. Only if these first parameters give a go-ahead, more data about the company (e.g. years of operation, suppliers & customers, cash flow) and the owner (e.g. legal and commercial background) is collected.

The credit analytics engine mCAE, which was built in-house, analyses all data (among which bank statements that are digitalised using OCR tech-nology) and gives back a probability of success score based on how much the new application resembles what is in the performing portfolio. A predetermined probability score threshold determines the go or no-go for financing.

liwwa's leveraging of smart financial technology enables the credit assessment team to focus on the most promising applications, which increases operational efficiency. As a result, the company can offer smaller loans (including tickets of $10K or below) at a competitive, risk-based price.

The mCAE credit scoring model is continuously and automatically refined through machine learning. It also conducts back testing of the existing loans portfolio to create real-time insights for instance into how certain sectors are performing.

For individual and institutional investors, liwwa built an online lending platform, or market place, that posts approved loans (which for the first 6 weeks are kept on liwwa's own balance sheet) for investors to fund directly through their online liwwa account. By selling off part of its loan portfolio to third-party investors, liwwa enhances its own capital structure, which impacts solvency, while investors earn regular monthly returns. The median Internal Rate of Return on investment

since 2015 is roughly 13%.

Key challenges and solutions

• Tech innovators like liwwa that work with mobile applications that can be incrementally improved, have a clear advantage over traditional banks whose legacy IT systems often stand in the way of improving their operational efficiency or customers' experience. On the other hand, fintech firms in emerging markets are still proving their worth. To scale their portfolios, they need to attract considerable finance. However, investors who dare put their money with these 'high risk-high impact' businesses are scarce. Initially this was also a major challenge for liwwa. The DGGF was the first international institutional investor willing to help liwwa step up its game. This sign of trust has since catalysed funding for liwwa from other institutional investors.

In 2018, H2 Ventures and KPMG ranked liwwa among the 50 Rising Star fintech innovators ▶ worldwide.

MoFA
theme
Private Sector
Development

Sustainainable
Development
Goal

8 DECENT WORK AND ECONOMIC GROWTH

Digital
technology
Online platform
and dashboard
Digital analytics and
monitoring tools

Country or region
Global
with pilots in Brazil,
Indonesia, Viet Nam, India

Lead implementing
organisation
The Sustainable
Trade Initiative
(IDH)

Project: Verified Sourcing Areas

A landscape approach for creating large-scale sustainability impact

Verified Sourcing Areas (VSA) is a new market mechanism that brings together landscape and supply chain approaches to accelerate the production and sourcing of sustainable commodities globally. While certification schemes verify the sustainability of individual farmers or producers, VSAs reward the sustainability of whole regions (a municipality, district or province) and have impact on multiple sustainability targets at once. As a result, entire production areas can be connected to global markets.

This means that end-buyers can source large volumes, in line with their company's sustainability commitments, at a competitive scale and price. Because of the scale of the VSAs, issues such as deforestation, environmental governance or labour rights can be addressed more effectively for more and faster impact.

The VSA approach is developed by IDH with financial support from the Dutch MoFA.

THE VERIFIED SOURCING AREA MODEL
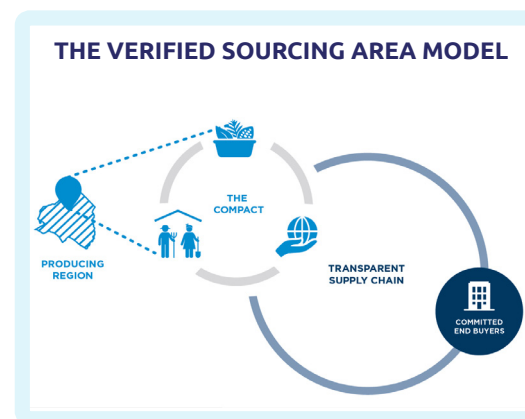
Achievements and added value

VSAs are not a model externally imposed on producers and supply chain actors. Instead, local private, public and civil society actors come together to discuss priority sustainability topics, targets and indicators and commit to work on these together. This is laid down in a

Compact. In Juruena Valley in Brazil a first Compact on beef production was signed and will be invested in by Carrefour Brazil. More compacts are being negotiated in VSA readiness pilots in Indonesia, Vietnam and India. Major global end-buyers are expressing interest in the approach. Mars, PepsiCo and Unilever have joined the VSA Global Steering Committee and actively pursue the support of compacts in areas they source from.

The VSA Information Platform is expected to go live in 2020. IDH collaborates with frontrunner agencies in digital monitoring, traceability and analytics to make this happen.

The platform will have a dashboard publishing visual analyses of the progress on indicators for agreed sustainability targets. This is to support and inform the sourcing

decisions of end-buyers. Digital technologies used for monitoring performance may include remote-sensing tools for land use change or GIS models for risk-based sampling instead of individual auditing.

Going forward, the dashboard will integrate information on trade flows from the producing VSAs to consumer countries, as well as the impact of these trade flows on social (e.g. labour conditions, land tenure) and environmental (e.g. deforestation, biodiversity loss) issues.

To do so, IDH will leverage the work of existing initiatives such as Trase ▶ that map entire supply chains by using public data sources such as production, trade, tax registration, export, shipment and customs data.

The platform will also have an advocacy and promotion section, where stakeholders in the VSA can showcase their progress on performance indicators with visuals and infographics as well as through storytelling, videos, etc. A strong user experience driven design based on "play" and "learn" will entice stakeholders to become active contributors.

End-buyers and investors can use this information to show consumers and shareholders how they contribute to the sustainability of producing regions and supply chains.

Finally, the VSA model will be a vehicle for catalysing finance to those areas that have developed a Compact and show progress in sustainability. This will include both public investments, sustainability funds from end-buyers, as well as commercial finance in a blended model. For this purpose, IDH will make use of existing and emerging fintech tools and services.

Key challenges and solutions

• All Compacts are obliged to include the VSA Global Impact Themes: forest and peat protection, good governance, labour, land tenure, and transparency. It is a challenge to formulate indicator sets for these themes that are comparable between regions. The indicators need to 'make sense' for both global and local stakeholders, be broad enough to cover all issues of major importance, while at the same time be focused enough to ensure progress is made and measurable.

The model should ease the work of sourcing and procurement departments of the end-buyers, as well as respond to what their con-sumers wish to know. In brief, the challenge is to optimise the use of digital technology for translating complex and 'messy' information on the ground to an understandable, digestible and actionable set of highlights on the consumer end of the supply chain.

ANIMATION
What are Verified Sourcing Areas?

MoFA
theme
Private Sector
Development

Sustainable
Development
Goal

Digital
technology
Online platform

Country or region
Global
in developing countries

Lead implementing
organisation
UNCTAD

Project: eT4 Women

Women leaders in e-commerce inspire the next generation

In early 2019, UNCTAD launched a new network for women leaders in e-commerce, the eTrade for Women Network ▶. The activities of this Network are meant to showcase, support and catalyse opportunities for women in developing countries to benefit from the fast expansion of e-commerce business and the digital economy across the world.

The eT4Women Network wants to contribute to target 5.b of the SDG Agenda: promote the empowerment of women through ICTs.

The Network is funded by the Dutch Ministry of Foreign Affairs and linked to the eTrade for all ▶ initiative launched by UNCTAD in 2016 to help developing countries build the knowledge and capacity to benefit from e-commerce.

Challenges

In Africa, an estimated 27% of all entrepreneurs are women, which is said to be the highest rate in the world. However, most of these women run very small, subsistence-level businesses.

Women who own bigger businesses often work in sectors such as textiles and fashion; very rarely do we find successful female entrepreneurs in tech-related business. This provides a clue to a major obstacle for women in developing countries to become successful e-commerce entrepreneurs: their digital literacy and skills are often very limited, caused by a persistent gender digital divide.
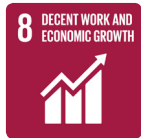
Moreover, it is very difficult for women to get access to finance to grow their e-commerce businesses.

(Courtesy: UNCTAD)

Microfinance institutions typically target women, but very few conventional banks or venture capital firms are willing to provide considerable loans to women who run sizeable start-ups or even profitable larger businesses. This bias is perpetuated by the culturally defined self-censoring attitude of many women.

Research shows that increasing

MoFA theme
Private Sector Development

Sustainable Development Goal

5 GENDER EQUALITY

8 DECENT WORK AND ECONOMIC GROWTH

Digital technology
Online platform

Country or region
Global in developing countries

Lead implementing organisation
UNCTAD

numbers of women in developing countries run small e-commerce businesses on platforms like Facebook, but that very few of them have a company website or use online payment platforms.

Even if given the opportunity to scale up and professionalise, many women are hesitant for fear of the disruptive impact that their success might have on fulfilling their family duties and on their relationships with husbands or other male relatives.

Added value

The eT4Women Network will address all these obstacles. For the first year, 5 to 10 highly successful female founders of e-commerce businesses from the Middle East, Africa, South and East Asia and Latin America will be selected as the programme champions. Giving them visibility is meant to inspire the next

generation of women entrepreneurs and e-business leaders in developing countries.

The eTrade for Women online platform will be used to showcase their experiences, to facilitate structured exchange on success stories and challenges, and thus to build a learning community. Knowledge and information offered on the eT4all platform, including data and indicators ▶ on the e-commerce readiness of many countries worldwide, will also be accessed.

Learning and capacity building will also happen offline. The women leaders will support and empower aspiring female entrepreneurs and start-ups in their economic field and/ or country through masterclasses, mentorship and tutoring.

Last but certainly not least, UNCTAD will support the female champions

to take part in policy processes, both domestic and international, which influence women's opportunities to participate in e-trade and e-commerce.

Discussions at the Trade Ministry (e.g. import/export policies and taxes) are obviously relevant, but so are Education (digital literacy), Finance (loans and capital for women entrepreneurs, online banking and payment regulations), Telecommunications (access to and cost of broadband), and Logistics (postal services). In many developing countries, these policy fields are very male-dominated.

If women can take a seat at the table, participate in national e-commerce strategy development and consultative processes, and influence policy by voicing gender-specific issues and concerns, this is a first and very necessary step towards a more inclusive e-commerce industry.

| E-commerce assessments | ICT infrastructure and services | Payments | Trade logistics | Legal & regulatory frameworks | Skills development | Financing for e-commerce |

8 DECENT WORK AND ECONOMIC GROWTH

Project: Farming Solution app

Boosting the productivity and autonomy of smallholders

With an increasing uptake of mobile applications, Solidaridad intends to invigorate its long-time mission: fostering the resilience and autonomy of small-scale farmers and producers worldwide. What started as a web service on a tablet used by extension workers in Brazil, has developed into Farming Solution leading a suite of applications of which several are used by small-scale producers of palm oil in Malaysia, Indonesia and Central America, coffee in East Africa, and fruits and vegetables in Latin America.

Producers can make tremendous productivity gains if they have access to the best agricultural practices. The apps complement conventional technical assistance.

They provide crop and context-specific information and ad-vice, based on scientific research and on Solidaridad and its partners'

(Courtesy: Solidaridad)

expertise, in different audio-visual formats. This helps farmers to identify, plan improvements and monitor progress on their farms over time.

Achievements and added value

The tool starts with a self-assessment conducted by the farmers using their smartphones.

A structured questionnaire on the app asks 50 questions concerning sustainable cultivation in 4 areas:
- farm management (e.g. soil health, fertiliser use)
- labour and community rights (e.g. equal wages, child labour)
- water and energy management (e.g. use of ground water, fossil / renewable energy)
- ecosystem and environmental sustainability (e.g. deforestation)

In a recent pilot in India, 48,000 small-scale sugar cane farmers in Uttar Pradesh conducted the i3SF self-assessment. After entering their data, the farmers receive back a performance score, followed by suggestions for improvement in a detailed work plan.

The app's interface differs per country and/or crop to ensure the most effective interaction with the users, in their mother tongue.

The backend software has been developed in such a way that regional Solidaridad teams can independently make additions to the central database, based on
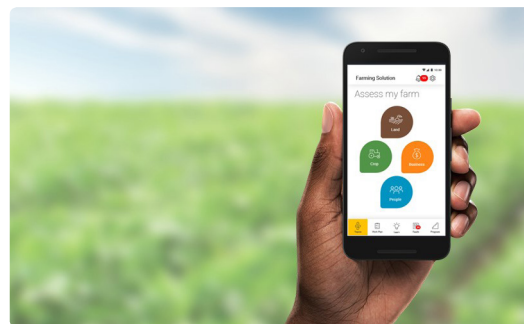
context-specific agricultural, climatological and socioeconomic variables relevant to the farmers.

They can adjust the questionnaire and the content of the work plans. The central database keeps growing the already thousands of registered best practices related to irrigation, pruning, harvesting, the use of fertilizers, storage, etc. All practices are indexed by international sustainability standards.

The apps also work when farmers are offline; data is uploaded automatically as soon as they have network connectivity.
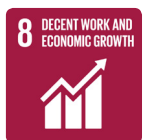
Each functionality on the app has a 'voice' option, to give the farmer a choice between reading or

listening to the instructions and advice.

Through interactive voice response, farmers can call in to ask questions about for instance the most effective pest management methods.

Challenges and solutions

- Solidaridad is investing in a more data-driven approach to achieving sustainable agriculture. The technical opportunities for scaling the Farming Solution and other applications are plenty. India for instance has around 5 million sugar cane farmers. It is forecasted that 60% of these will own smartphones by the end of 2020. Mobile networks are constantly being expanded, also in remote rural areas.

- However, the challenge is to make the apps and other digital tools self-sustainable in terms of costs. Frequent use by the farmers is one of the conditions for this. The self-assessments only need to be conducted a few times a year, depending on the crop cycle. To

MoFA theme
Private Sector Development

Sustainable Development Goal

8 DECENT WORK AND ECONOMIC GROWTH

Digital technology
Mobile phone technology
Open source platform
Dashboards

Country or region
countries in East Africa, Latin America, Central America, South Asia and Southeast Asia

Lead implementing organisation
Solidaridad

incentivize the farmers to make more use of the app, additional services are added, such as local weather information with associated instructions (on the app or by SMS: "Advised not to irrigate, rain is expected tomorrow morning"). In the future, financial services will also be added. The single-issue apps will thus evolve into digital farming companions that provide targeted advice and access to a broad array of services. If enough farmers are using the apps frequently, it may become interesting for agricultural service centres within the countries to take on the service as part of their business. This local ownership is what Solidaridad envisions for the long-term.

• Privacy and data ownership are another challenge. The GDPR is used as the guideline; additional regulations or standards are included if required by the laws in the programme country. Most importantly, Solidaridad wants farmers to be autonomous and not to be locked into the fast-growing number of (commercial)

agricultural apps often developed for large agrarian corporations. Digital data are a highly marketable asset.

In the long run, Solidaridad envisions a model where data ownership lies entirely with the farmers and where the money generated by the data directly and measurably flows back to the farmers: "Fair Data" as an extension to "Fair Trade".

Raising awareness among farmers about the power of the data they generate is a first step. In countries like India, the vast volumes of data that would be generated if smallholders all used an app like the current ones, could give them bargaining power to a vast number of stakeholders in the agricultural value chain. Data as the new commodity!

VIDEO
How Farming Solution works

65

Prospects for Refugees & Migration Cooperation

Project: Refugee registration system

Digital data improve access to basic services and legal rights

Ethiopia ▶ hosts hundreds of thousands of refugees from the Horn of Africa and beyond. Many of them are long-staying refugees.

Until recently, two parallel registration systems existed: one by UNHCR and one by the Ethiopian government's Administration for Refugee and Returnee Affairs (ARRA). The latter was entirely paper-based, the former partly.

In August 2018, a fully digital registration system for all refugees within Ethiopia was launched, integrating and harmonising the UN and government systems. The new system includes UNHCR's Biometric Identity Management System (BIMS) as well as Level 3 registration, which allows refugees to record information on their health, educational and professional skills and aspirations, as well as details

of family members located in other regions or countries. Meanwhile, UNICEF worked with the Government of Ethiopia's Vital Events Registration Agency (VERA) to also digitalise and open this civil registration system for refugees. Since October 2017, refugees can record life events like birth, marriage, death or divorce in the VERA system. This means that for the first time they can easily obtain

legal documents (e.g. marriage and birth certificates) from any local government office.

The project is rolled out under the Regional Development and Protection Programme (RDPP) ▶ for Ethiopia. It is part of the wider RDPP in the Horn of Africa led by the Netherlands and funded under the EU Emergency Trust Fund for Africa (EUTF).

(Courtesy: UNHCR)

Achievements and added value

UNHCR provides a dashboard ▶ with real-time data on the registration progress.

The integrated digital system provides entirely new opportunities for humanitarian agencies to improve protection of refugees and better target assistance.

Data on, for instance,
% well-educated refugees,
% minors, % single-parent households or % vulnerable groups can be easily detracted.

Analysis of the digitalised L3 data helps to tailor assistance to the actual needs of individuals and at refugee camp level. Previous paper-based records with this type of information were impossible to use effectively.

A major efficiency improvement is the 'one-stop shops' that were established in 27 refugee camps.

Refugees no longer need to spend

days queuing to be registered (twice!) by UNHCR and ARRA. All services are provided in one physical location and legal documents can be obtained through the VERA desk at the same location.

More than 70,000 refugee children born in Ethiopia over the last decade who did not have their births registered can now be issued with birth certificates retroactively.

Having a birth certificate is often crucial for refugees who wish to access basic services like education and health care in their host country. Moreover, birth registration establishes a person's legal identity and may help to prevent statelessness ▶.
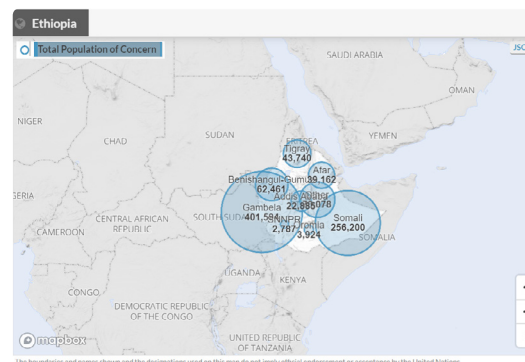
Key challenges and solutions

- Apart from the complex software integration process, the network infrastructure proved a major obstacle to the implementation of the new registration system. The transmission masts built in several locations proved insufficient to guarantee uninterrupted internet access. Eventually, a partnership with Ethio Telecom, which agreed to install underground network cables, resolved this problem for most regions. It is for this same reason that PRIMES ▶, UNHCR's new global single entry service platform, which integrates a suite of applications for its humanitarian partners and refugees, was developed with an offline component (RApp) for data entry in remote locations.

- Digital registration of refugees can be a sensitive undertaking for political and personal security reasons. The new registration system in Ethiopia, like PRIMES, is aligned to the Policy on the Protection of Personal Data of Persons of Concern to UNHCR ▶.

Project: DTM
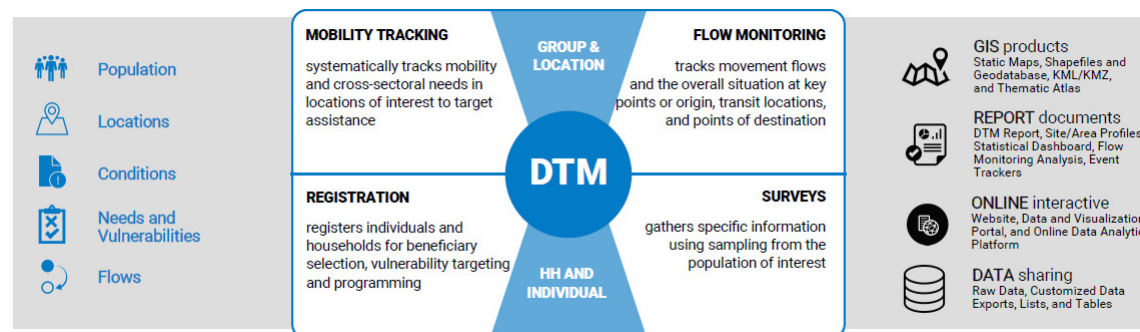**(Displacement Tracking Matrix)**

Improving humanitarian responses for people on the move

DTM is a modular system to track and monitor displacement and population mobility.

Information is systematically captured, processed and disseminated to provide a better understanding of the movements and evolving needs of mobile populations, especially internally displaced persons (IDPs).

The DTM provides information on three online platforms:

- https://displacement.iom.int ▶ (on IDPs)

- https://flow.iom.int ▶ (on regional migration flows)

- http://www.globaldtm.info ▶ (for narrative reports).

DTM is currently tracking over 26 million IDPs, 22 million returnees and 5 million migrants across 71 countries, supported by more than 5,400 staff. It has become the most important source for IDP data in the humanitarian sector.

DTM also monitors human mobility trends across broad geographical regions, based on flow data, different from any migration statistics produced so far.

Achievements and added value

DTM is fast growing in scope, witnessed by the 98% increase of the Central Data Warehouse from 15,758,409 pieces of information in 2017 to 438,393,138 in 2018, and the 4201% increase of monthly downloads of DTM outputs between January and December 2018 (from 824 to 35,443 downloads).

UN organisations, governments and (I)NGOs also use IOM's DTM data. In 2017, IOM and UNICEF launched the "DTM Children on The Move" project,

integrating child protection and education indicators into DTM tools and information management systems.

Following on recommendations by the Working Group on Useful and Usable Data and Analysis (EDAUUR) established as part of the Grand Bargain ▶, IOM launched the DTM and Partners Toolkit ▶. It is the product of a collaborative effort between DTM, Global Clusters, Areas of Responsibility and Working Groups to determine which data and information are more valuable for which humanitarian actors to support their operational and strategic decision-making.

Since 2017, a DTM Data Management Officer from the Global DTM Support Team has been based at the OCHA Humanitarian Data Centre, which manages the Humanitarian Data Exchange (HDX) ▶ platform.

Publishing DTM datasets on HDX increases the usage of DTM data by other humanitarian actors.

Key challenges and solutions

• Initially, the DTM operations focused on collecting data at country level. With limited capacity, datasets between countries were not always compatible and regional data analysis was complicated. In late 2016, the Dutch government provided a 4-year grant that allowed the Global DTM Programme to make data sets compatible across countries, scale up regional operations, and strengthen staff capacity for regional analysis.

• Since then, the volume of data keeps growing at a fast pace. In crisis situations, DTM is often under pressure by third parties to make data available fast, even in real-time. However, the ethical use of what can be politically very sensitive data has been a DTM priority from the start. The DTM "data dictionary" classifies data as either public, sensitive, or private. For instance, data related to unaccompanied minors is labelled either sensitive or private. In cases when sharing a dataset with locations of populations displaced may be sensitive, the entire dataset is not available on the online platforms, but it is shared with humanitarian stakeholders. For flow monitoring (cross-border migrants), no personal data is collected; only demographic data.

• DTM sponsored the Harvard Humanitarian Initiative to produce a document titled 'The Signal Code: Ethical Obligations for Humanitarian Information Activities' ▶ and is using the recommendations to identify and resolve gaps in its own operations. DTM also initiated and leads an informal inter-agency working group (with, among others, Leiden University, Harvard University, UNHCR and WFP) on data science, artificial intelligence and ethics. The starting point for DTM is that algorithms are always biased and can never replace the human mind in decision-making.

• In 2009, IOM was one of the first international agencies to publish its own internal data protection policy ▶.

Security and Rule of Law

Project: Human Security Survey

Data for empowerment: moving away from a battle of truths

The Human Security Survey (HSS) is a methodology developed by PAX's Protection of Civilians ▶ (PoC) department to collect data and facilitate constructive dialogue about civilians' experiences, perceptions, and expectations in situations of conflict. By using the open source mobile software tool KoboCollect, enumerators can collect survey responses in volatile and remote areas.

The survey is currently being implemented in three locations in Iraq ▶ (Basra, Kirkuk, and Salah al-Din Governorates) and four locations in South Sudan ▶ (Jonglei, Eastern Lakes, Southern Liech, and Jubek States).

In this project, PAX collaborates with the Al Amal Association and the Al Firdaws Society in Iraq, and with the South Sudan Action Network on Small Arms and the Assistance Mission for Africa in South Sudan. The purpose of the HSS is:

• to increase the understanding of local security dynamics and trends

• to enhance the 'claim-making capacity' of civilians to identify their priorities and hold security providers and decision-makers accountable

• to inform evidence-based advocacy that enables international stakeholders to design and implement protection activities that reflect local realities

Achievements & added value

Introducing a digital tool to conduct surveys allows for rigorous, safe and high-quality data collection that facilitates dialogue in sensitive and fragile settings. The HSS fills a human security information gap for various audiences in both country contexts. When PAX used to organise community dialogue sessions before, there was always a "battle for truths" between the 'official knowledge-holders' (the security authorities), and community views. Now, backed by the large volume of data collected and analysed through the HSS, community members feel more empowered to express their views. It also allows them to hold authorities accountable.

The data is collected annually, allowing to identify trends in the experiences and perceptions of people's security situation. Data quality is ensured through the mobile application in several ways. Human error is reduced thanks to the automated skip logic in the survey. Whereas paper surveys require enumerators to familiarise themselves with survey logic step by

step, digital surveys have a built-in logic. This allows the enumerator to focus on the answers rather than the questions.

Because of the high sensitivity of the HSS content and context, it is essential that data is adequately protected. The mobile KoboCollect tool allows enumerators to move around and collect data in difficult regions without carrying conspicuous stacks of paper surveys.

The application has a built-in feature that automatically and immediately uploads all survey data onto the server through encrypted transmission and deletes all survey information from the mobile phone once the upload is completed. This ensures that the data cannot be confiscated from the enumerator by authorities or other interested parties. The uploaded data can moreover be accessed by PAX HQ in real-time, which facilitates quality control.

Key challenges & solutions

According to PAX, mobile surveying
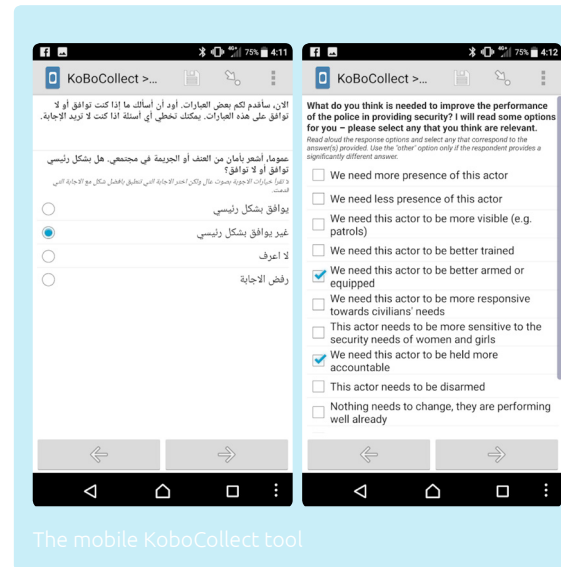
The mobile KoboCollect tool

is not by definition more effective than traditional research methods.

Its use depends on whether the context offers a strategic need and opportunity. In fragile and volatile contexts, there are both benefits and threats and challenges:

• The tool requires enumerators to conduct the survey on the ground, which means that vulnerable populations in the highest-risk areas may be very difficult to include at times.

• In certain contexts, it is difficult to hire female enumerators, who are needed for a gender-sensitive research approach.

• Digital literacy differs between countries and regions and people in conflict countries may be concerned about inappropriate use of surveillance through digital means. These concerns need to be considered in project planning and implementation.

• Due to the sensitivity of the survey content, anonymity must be assured. To maximise their agency, PAX asks survey respondents to provide their informed consent at the start and again at the closure of the interview.

• Different audiences have different information needs. Identifying those needs and transferring information to the intended users in a timely and secure manner remains a challenge. PAX is developing an interactive digital dashboard to give more actors access to the data, which can be tailored to their needs and interests.

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MoFA theme
Security and Rule of Law

Sustainable Development Goal

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Digital technology
SMS-based platform

Country or region
Uganda

Lead implementing organisation
Lawyers 4 Farmers

Project: Lawyers 4 Farmers

Taking legal services directly to the farm

Farmers in Uganda lack easy and affordable access to legal support. Time and money are precious: farmers cannot afford the costs and time away from the farm to travel to legal chambers to receive council. Moreover, they often do not even know what benefits legal proceedings could bring.

The SMS-based platform Lawyers 4 Farmers (L4F) ▶ was introduced to bring legal support directly to the farm. The digital platform removes the need for farmers to travel to access legal services and improves their knowledge of their rights for less than €1 (the cost of sending an SMS). Through basic feature phones, rural farmers, cooperatives and non-commercial urban farmers can receive direct and legal assistance and tailored support in their local language from the L4F staff. Since 2017, L4F has reached over 3000 in central and northern Uganda.

(Courtesy: Lawyers 4 Farmers)

Achievements & added value

L4F offers different types of services. Individual farmers who use the basic service can text-message a question to the short code 6115. They receive instant acknowledgement of their message and one-on-one advice from the team of all-female lawyers at L4F. This provide needs-based legal advice to larger constituencies at once, L4F also engages with leaders of cooperatives, representing up to 500 farmers. As an add-on service, the cooperatives can take part in on-site

trainings on their most common legal issues, such as land ownership rights for kibanja (piece of land) users. This allows L4F to share knowledge that cannot be conveyed in short SMS messages.

Since the start of L4F, there has been a shift in the interests and needs of the active users of the service. While at first the farmers were excited to learn more basic facts about the country's laws that affect them, L4F now sees a growing opportunity to move beyond giving instructions through SMS to making sure that farmers follow through on the instructions. L4F is looking into adding next-step services, for instance providing business registration and sales agreement templates through an online platform. This would remove the need for farmers to deliver documents by way of courier, and would reduce the costs dramatically.

Key challenges & solutions

• Technology has allowed L4F to grow regionally across five Ugandan districts, something

that would have been difficult to achieve through traditional methods of outreach and legal support. However, L4F emphasises that patience and persistence have been key in applying digital solutions to a traditional professional legal landscape.

Patience was needed to build the farmers' trust in the benefits, quality and opportunities of the new digital approach to offering legal support.

• More importantly, digital illiteracy is a real challenge in Uganda. Even sending a basic SMS can be difficult for some rural farmers and this reality should not be taken lightly if digital services are intended to be inclusive.

The platform therefore offers the option to have a community representative who communicates the legal needs of others through a shared phone number used by a single community.

By personalising questions and including references to names of

the clients, L4F can still provide personalised legal support to those with no access to or limited understanding of digital solutions.

• Finally, it was a challenge to find a financially sustainable model for this legal service. L4F uses a hybrid model: some services are absolutely fee (i.e. information-only services) while services that require additional support can entail minimum fees. For very poor farmers, even the additional services are provided at very low cost, for commercial farmers, L4F knocks off 10% from mainstream fees.
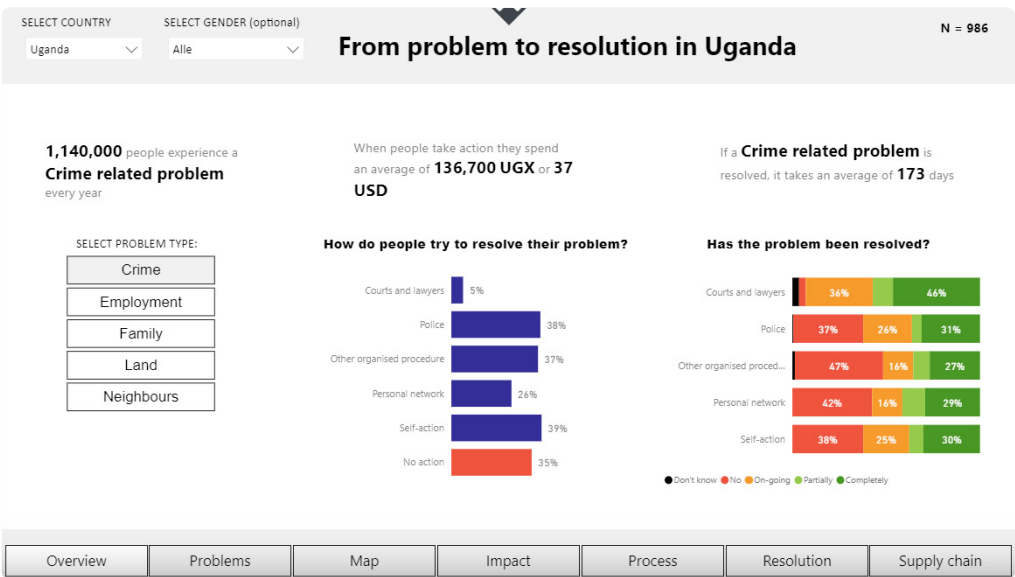
Project: Justice Dashboard

User-friendly ways to bring justice to all

The justice system generally follows traditional and established approaches to tackling legal issues and conflicts. HiiL ▶, a social enterprise devoted to user-friendly justice, introduced the Justice Dashboard ▶ to innovate the sector by placing people's needs at the centre of the system.

The online dashboard provides insights into justice needs and satisfaction levels of citizens in a diverse set of countries, ranging from the Netherlands to Yemen and Bangladesh. Rather than introducing top-down legislation and approaches, HiiL encourages the justice system to adjust legal interventions based on community needs.

While 'big' justice issues such as organised crime, drugs and trafficking of persons must be addressed, the emphasis that these

From problem to resolution in Uganda (screenshot Justice Dashboard)

topics receive may come at the cost of the daily justice needs of ordinary citizens. The Dashboard allows its users to extract data on a country's key legal problem types as perceived by its citizens, the impact of these justice problems and the extent to which people feel their justice needs are being met.

Achievements & added value

Legal innovators like HiiL are introducing a new eco-system to the justice sector, bringing together technology, creativity, and entrepreneurship with legal expertise. Until two years ago, HiiL relied on its reports to make an

impact. Data was collected, analysed and published to share with policy makers, lawyers and legal aid organisations. This approach allowed HiiL to use only a selection of its data.

By introducing the Justice Dashboard, HiiL has achieved a more accessible and interactive way of sharing its data. Users of the Dashboard have direct access to the data, which they can view in a fit-for-purpose fashion. Because not all potential users, especially legal professionals, are familiar with complex digital analytics, the Justice Dashboard was created to serve as a gateway to data that is more user-friendly. This allows users to focus on the questions they have, rather than on the technicalities.

Key to the success of the Dashboard is its emphasis on ensuring the relevance of the data. Each day, data becomes a day older and more remote from the reality of the current day. The Justice Dashboard therefore seeks to combine survey data sets with social media data. This allows HiiL to capture the current

debate on the most pressing justice needs. In Uganda, for example, legal issues concerning land disputes are the most pressing. The Dashboard turns to social media (e.g. Twitter and news websites) to discover how people are talking about land disputes. Do they refer to land grabbing, use of pesticides, or border conflicts?

By capturing the debate, even it is only a small slice of the public debate, the Justice Dashboard aims to show the most frequently occurring problems in people's actual lives. This helps to inform policy makers and legal professionals of the most pressing, current needs.

The algorithms delivering the Dashboard's content deal with text analytics, sentiment analysis and predictive analysis. Natural language processing mechanisms and algorithms help to extract information from unstructured (social media) data. The algorithms extract knowledge from the thousands of text bites on the topic discussed as well as the sentiments behind the discussions. The data is

aggregated and organised in indices which show the shifts in the discussions over time. In other words, longitudinal text analytics of subjects and sentiments helps to show trends and carries the potential to predict trends.

Key challenges & solutions

- HiiL sees technology as a major enabler, but the organisation emphasises that in the field of justice, tech is not the 'maker or breaker'. Careful consideration is required as to where and why a problem exists and how technology potentially can be introduced to solve it.

Successfully introducing technology in a traditional sector like the justice sector, requires adequate processes that place the intended users at the centre of discussions and dialogue on how technology can enhance the effectiveness of their work field.

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Project: LawPadi

Introducing technology to customise quality legal services at scale

LawPadi ▶ is a platform for educating Nigerian citizens about their rights and duties by giving clear and easy-to-understand answers to questions about the law and how it affects their daily lives. The platform offers free legal advice to businesses and individuals and makes referrals to the most suitable lawyers for the case at hand. In this way, LawPadi kills two birds with one stone: first, it addresses a big legal information services gap in Nigeria and, second, it matches lawyers with people in need of their services.

The platforms is unique in the customised legal solutions it can offer. By introducing chatbots that have been programmed to identify (and in the future, possibly, predict) the most pressing legal needs of the visitor, the platform is able to provide customised needs-based information.
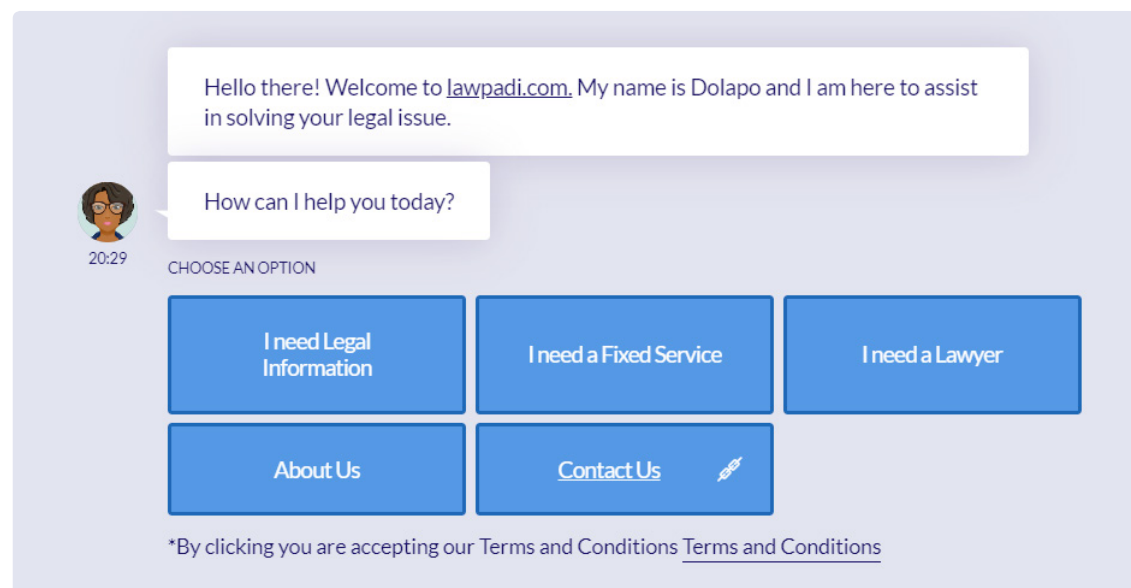
LawPadi chatbot (screenshot)

Achievements & added value

What started out as a basic Q&A website for legal issues in 2015, has grown into a platform that offers automated processes that create legal solutions. While the technology behind the platform is still relatively straightforward and accessible, placing the user-experience at the core of their services has been LawPadi's biggest success factor.

By automating information services through simple data analytics and chatbot tools, LawPadi's possible

outreach has expanded exponentially. With only 3 full-time team members, LawPadi is able to cater information and support services for about 40,000 unique visitors each month, expecting to reach half a million users in 2019.

Key challenges & solutions

- The current services can only be accessed by people who have (access to) a smartphone. Including people with limited digital literacy remains a challenge for tech-enabled services like LawPadi. The platform has developed a range of strategies to tackle the digital divide. These include sending agents into markets with tablets to provide one-on-one support in information provision and referral services, as well as offering Interactive Voice Recording (IVR) services to reach the illiterate population in need of legal support. However, these strategies are still pending financing.

- Financial sustainability is a serious challenge for LawPadi. To date, the

platform has been able to rely on seed funding and grants from institutions such as HiiL ▶.

However, LawPadi aspires to become a financially solvable company. The biggest hurdle is the Nigerian legislation that does not allow LawPadi to monetise their referral services. As a non-law firm, LawPadi cannot request fees for legal referrals (e.g. 10% of lawyer fee for a successful referral). However, if LawPadi would register as a law firm to counter this regulatory challenge, it would no longer be allowed to promote its services online, nor provide advice to their website and chatbot visitors on pursuing legal actions.

- One way to bridge this financing gap is by offering add-on legal services. LawPadi therefore helps people to register their businesses or trademarks, assists in name changes, and offers other basic legal services at lower prices than mainstream law firms. This is not always appreciated by other legal professionals and law firms who have accused LawPadi of

"destroying the industry" by providing services at much more affordable rates. The team at LawPadi, however, takes these accusations as proof that they are on the right track by challenging the system to create better ways of meeting the pressing legal and justice needs of the average Nigerian.

Project: IMSMA
(Information Management System for Mine Action)

Putting big data to use for enhanced demining impact

Since the mid 1990s, organisations involved in demining started asking for computerised decision support tools to assist the coordination and management of their operational activities. The IMSMA ▶ was developed in response to these demands and rolled out in 2004. It is currently used in more than 80% of the mine action programmes around the world. It is also the United Nations' preferred information management system for mine action.

The IMSMA software is provided for free and used by Mine Action National Authorities (NMAA) or organisations fulfilling this role for a specific country or region.

Core elements of IMSMA include an open-source database engine and a geographic information system (GIS) for displaying information on maps. The IMSMA Wiki ▶ offers support services for installation, use and information management of the IMSMA system and tools.
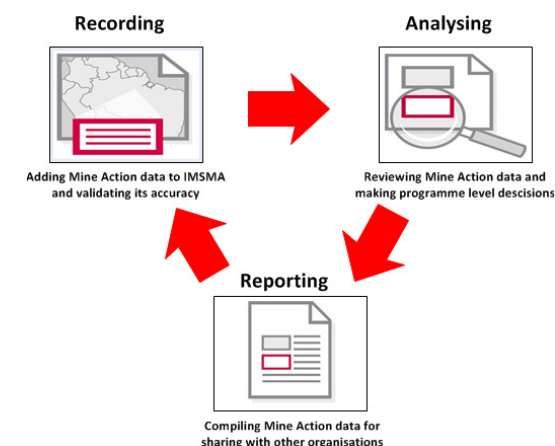
Achievements & added value

Mine action information management focuses on contaminated land and the activities or processes undertaken to reduce or eliminate this contamination (i.e. clearing the hazards) in a process called land release. The role of a management system is to collect information about each step and accurately report the status and attributes of each hazard.

This information informs the workflow to support operational activities such as planning, tasking and (priority) clearance operations.

Interoperability, flexibility and user-friendliness were the three key words for the development of IMSMA.

The system divides information management into three phases: recording, analysing and reporting.

Recording — Adding Mine Action data to IMSMA and validating its accuracy

Analysing — Reviewing Mine Action data and making programme level descisions

Reporting — Compiling Mine Action data for sharing with other organisations

First, data entry forms are used by field officers to enter details about an area, activity or event. IMSMA standardises data entry as much as possible to facilitate comparability and interoperability of data sets.

MoFA
theme
Security and
Rule of Law

Sustainainable
Development
Goal

16 PEACE AND JUSTICE STRONG INSTITUTIONS

Digital
technology
Big data
PostgreSQL
Database engine
GIS

Country or region
47 countries in Africa, Asia,
the Middle East,
Latin America and Europe

Lead implementing
organisation
Geneva International
Centre for Humanitarian
Demining
(GICHD)

Secondly, IMSMA examines large numbers of data sets through customisable tools for visualising and analysing mine action data. Users can display image-based information on a map, including icons identifying the location of an item by its type, high-resolution satellite images and topographic details, or they can request text-based summaries of the information entered into IMSMA. Lastly, mine action data is compiled into customisable reports which are stored as templates in the database so that field officers do not need to configure new reports each time.

The software enables stand-alone installations for small mine action programmes as well as configurations for large programmes with many users distributed across multiple sites and organisations. Furthermore, GICHD provides an option for decentralised information exchange: IMSMA Remote Entry (IRE).

IMSMA's can include different types of data and information sets to establish what actions are being undertaken by different organisations and what the priorities for mine action are in a certain area.

For example, there might be two locations with mine fields, one with 1000 and one with 100 mines. Based on only this information, it seems logical to first clear the location with the most mines. However, information provided by IMSMA may refute this logic as it can show the potential impact of mine actions. It may turn out that the location with the least mines is more densely populated, is located along an active trade route or leads to a school. This additional information will change the decision-making tree.

IMSMA connects and links existing and new data sets from national bureaus, the World Bank and other humanitarian agencies into an operational management tool for the highest impact.

Key challenges & solutions

- IMSMA promotes standardisation of mine action data. However, organisations continue to use different categories and reporting standards for crucial information such as the type of mines (e.g. old mines, landmines, improvised explosive devices, etc.). This poses challenges for linking data and information sets for maximum impact.

- Making use of 'big data' has obvious benefits, including easier operationalisation of data, cost-effectiveness and user-friendliness. However, it also means that human interference in data processing and analysis becomes more limited. Can we rely on big data and algorithms to consider the consequences that interventions in one area may have on another area? This kind of information remains essential for achieving wide-spread benefits of big data analytics.

VIDEO
Understand your contamination

Water

MoFA
theme
Water

Sustainainable
Development
Goal

6 CLEAN WATER
AND SANITATION

Digital
technology
Smartphones
Digital platform
Databases
GPS

Country or region
> 20 countries in Africa,
Asia and Latin America

Lead implementing
organisation
Akvo

Project: Caddisfly

Improving water quality:
from smartphone to change

Universal access to safe and affordable drinking water is is a major global challenge.

Over 40% of the world's population face water scarcity and many are affected by water contaminants.

With Caddisfly, Akvo works at the district level with government officials, who are responsible for water quality.

The aim is, firstly, to assemble information on water quality at a large scale, including at the household level.

Secondly, the initiative aims to set a new standard for effective gathering and sharing of data relating to drinking water quality at scale, using the best available tool for this purpose: the smartphone.

Caddisfly provides fast, easy to use, on-the-spot water quality testing (of over 30 parameters) that is far more transportable, scalable and affordable than traditional methods.

The Caddisfly (Android) app takes the user through each test step by step and, where needed, determines the test result.

Pictures of individual test results are included for quality assurance.

Data can be visualised and shared immediately through an online platform and dashboard.
The data can be automatically exported to other platforms.
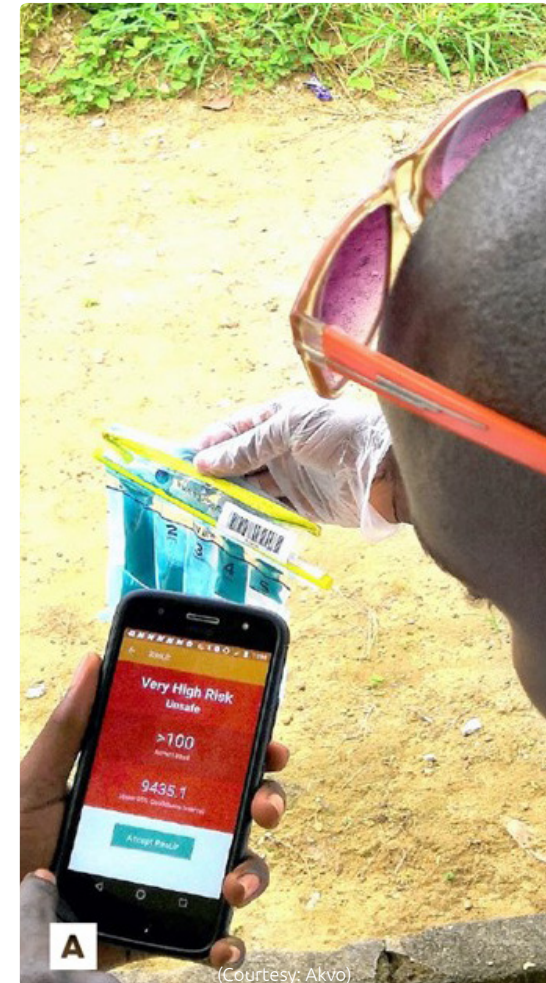
(Courtesy: Akvo)

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Caddisfly

MoFA
theme
Water

Sustainainable
Development
Goal

Digital
technology
Smartphones
Digital platform
Databases
GPS

Country or region
> 20 countries in Africa,
Asia and Latin America

Lead implementing
organisation
Akvo

Achievements and added value

The results are immediately available and provide insights that are actionable. Using smartphones reduces costs and makes results immediately accessible, allowing water quality testing to be scaled up affordably. This leads to faster, better interventions.

Akvo has developed a partner engagement framework as well as sustainability standards and dashboards to make sure partners are supported in the process from data collection up to data sharing and use.

Akvo uses open source systems. Many clients contract Akvo for water quality inventories, including governments, companies, NGOs and UN agencies.

Data-driven development is very important for measuring progress in relation to the SDGs. The work of Akvo contributes to at least seven SDGs.

With the Caddisfly app, data can be

gathered offline. This is especially important in the case of emergencies, such as epidemics. Once there is a network connection, the data is automatically transmitted. A survey in Sierra Leone in 2017 revealed that E.coli was present in 90% of household water, while water at the source was safe to drink. This led to behavioural change interventions in 1100 communities.

Key challenges and solutions

- Akvo uses a cloud-based system. This creates a certain dependency on the big providers such as Amazon or Google. Akvo therefore aims at establishing local ownership and access to data.

- Clients are the owners of the data. Akvo is GDPR compliant and promotes responsible data use.

- To achieve acceptance for this new technology use, resistance from more traditional players needs to be overcome.

- In addition to the water quality data gathered by the Caddisfly

app, household and other data are needed to determine the root causes of water contamination.

- Scaling up the process from data collection to data sharing and use is complex, but a clever approach with smartphones is a promising step forward.

- Using a smartphone eases the process, but water quality testing, including proper use of the test kit, still requires specific knowledge. Akvo provides training and support where needed.

(Courtesy: Akvo)

VIDEO
Akvo Caddisfly

MoFA
theme
Water

Sustainainable
Development
Goal

6 CLEAN WATER
AND SANITATION

Digital
technology
Earth observation
Digital platform
Databases

Country or region
Africa and the Near East

Lead implementing
organisation
FAO

Project: WaPOR
(FAO's portal to monitor water productivity through open-access of remotely sensed derived data)

Improving agricultural water management with the help of satellite data

The WaPOR ▶ data portal, hosted by the Food and Agricultural Organisation of the United Nations (FAO) is a database that uses satellite data to monitor agricultural land- and water productivity throughout Africa and the Near East.

WaPOR provides access to 10 years of continued observations over Africa and the Near East.

The portal provides open access to various spatial data layers related to land and water use for agricultural production and allows for
• direct data queries
• time series analyses
• area statistics
• data download
  of key variables

to
• estimate water and land productivity gaps in irrigated and rain fed agriculture

• monitor trends of water use in irrigated areas
• assess the influence of droughts on agricultural production.

The portal was developed by a Dutch consortium under the responsibility of the FAO.
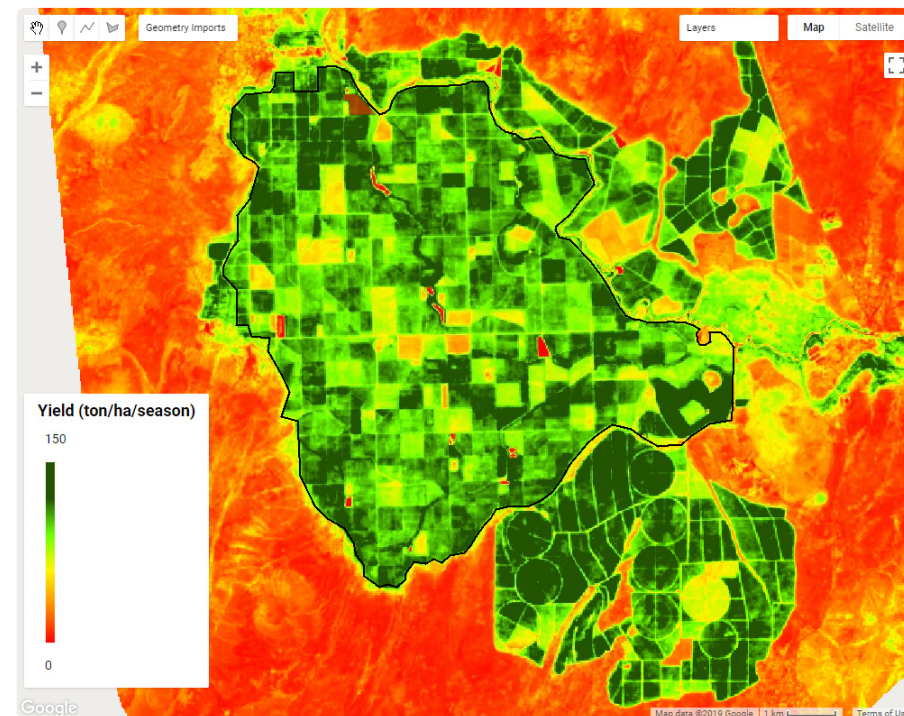
WaPOR derived yield for sugarcane in 2015 for the Wonji irrigation scheme, Ethiopia (Source: IHE Delft)

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MoFA theme
Water

Sustainainable Development Goal

6 CLEAN WATER AND SANITATION

Digital technology
Earth observation
Digital platform
Databases

Country or region
Africa and the Near East

Lead implementing organisation
FAO

Achievements and added value

The near real-time monitoring is meant to assist relevant stakeholders in identifying water productivity gaps and devising solutions to reduce these gaps. This will contribute to a sustainable increase of agricultural production and thus food security.

In addition, the database will contribute to a more sustainable, productive and climate change resilient way of practicing agriculture, with a reduced impact on the environment in general and on fresh water resources in particular.

Thanks to the digital technology used, larger areas can be covered with fewer resources invested than with traditional monitoring methods. Moreover, the results are more accurate because they take an entire area into consideration.

The continued provision of services such as WaPOR serves as a good showcase for Dutch expertise in geospatial technology.

Key challenges and solutions

• The possibilities for scaling WaPOR are promising, as the methodology can easily be replicated. The main challenges are, first, to keep the database operational and up-to-date, which requires considerable funding, and second, to get a critical mass of WaPOR users through clever marketing.

• WaPOR version 1.0 was released in May 2018 and shows great improvement compared to the Beta version launched a year earlier. Two quality assessment reports from IHE Delft and the Frame consortium describe the improvements made to the database.

Publicity around WaPOR is now intensified with a demo presentation on the World Day to Combat Desertification and Drought (June 17) and a special session during the World Water Week.

• The WaPOR database is working well for large areas cropped with monocultures such as sugar cane. Further studies are required to assess the value of analyses for smallholder farms and mixed cropping systems.

VIDEO
WAPOR

Project: Water, Peace and Security

Reducing the risks of water conflicts through innovative tools and services

Water insecurity is increasing worldwide. Water scarcity, droughts and floods affect a growing number of people, while ecosystem losses and climate change impacts are expected to aggravate this situation.

This will most likely lead to more conflicts over water. The tension between Egypt and Ethiopia over the allocation of Nile water is a case in point.

To prevent such conflicts, the Water, Peace and Security partnership ▶ supports communities to take action at an early stage. The partnership designs innovative tools and services that identify water shortage-related security risks. These tools and services demonstrate changes in short-term water availability and their impacts on societies, and link these changes to hydrological, as well as social, economic and political factors.

Based on this information, evidence-based actions can be triggered to prevent or mitigate human security risks. The Water, Peace and Security partnership promotes this by raising awareness, developing capacities and supporting dialogue.

Two models are being developed:
• a global water tool to identify water scarcity and hotspots that could lead to conflict
• a local model that forms the basis for the stakeholder dialogue

Pilots of the local model, which is adaptable to local circumstances, are being carried out in Mali (internal Niger delta) and Iraq.

The two types of models have different formats:
• the global model contains general information on challenges related to water

• the local model presents more details on hydrology and the use of water resources. It also provides a response model.

The target group consists of national governments (decision makers, including politicians), communities and the private sector (including investors).

The sequence followed is:
• understand
  (water-related security threats)
• mobilise
  (inform stakeholders)
• learn
  (training and capacity building for crisis mitigation)
• dialogue
  (bring all stakeholders together)
• act
  (address water-related security threats)

Achievements and added value

Machine learning is a key element of the applied digital technology, which used open-source software. However, the output of the model(s) is only available to stakeholders involved, as it concerns sensitive information.

Digital information (satellite data fed into global datasets) and processing (models using machine learning) is key to the tools and services provided.

A test run with the global model shows 85% accuracy in identifying of hotspots, which is good, especially taking into consideration the many different types of data (including proxies for social data) that are used.

(Courtesy: IHE Delft)

(Courtesy: IHE Delft)

Key challenges and solutions

• The increasing availability of global, open and freely available datasets facilitates the application of modelling and the implementation of the methodology anywhere in the world. A challenge is that sometimes new and/or more data will have to be acquired locally to make the model work properly.

• Long-term funding of the initiative is another challenge. The willingness of all stakehold-ers to cooperate in a constructive way is what will make or break the partnership.

• The risk exists that governments

and other stakeholders may use the information to pursue their own interests, instead of cooperating to solve conflicts. However, the Water, Peace and Security initiative will also lead to increased transparency, counterbalancing this risk.

VIDEO
Water, Peace and Security

Food for digital thought

Digital transformations can support more inclusive growth and development

The cases in this publication have shown that platforms help consumers negotiate better prices and identify higher quality products. They give marginalised citizens a first-ever opportunity to voice their concerns about public service delivery, or youth to speak out safely on taboo subjects that matter to them. Other cases have shown that m-health applications can speed up universal healthcare coverage or improve fast diagnosis of major diseases, that smart use of credit analytics engines and FinTech applications can provide underserved SMEs with access to loans. Big data analytics has helped to map entire supply chains and their environmental impacts and food security can be improved by offering low-cost or free information services to smallholder farmers.

At the same time, the examples also make clear that there are still many barriers to achieving maximum impact, such as the persistent (gender) digital divide, or finding sustainable financial solutions for offering low-cost services. All of this takes place in a field that is rapidly developing, and policies and regulatory bodies are trying to keep up with the pace – but reportedly are struggling to do so.

Protecting human rights in the digital space is a serious concern and will remain so as the digital sphere is increasingly infiltrating people's personal lives through the devices they use and the services they have come to rely on.

What can we take away from this range of inspiring examples? The challenge lies with maximising the advantages while minimising the negative impacts of digitalisation.

A few learnings are worth sharing:

1 **An ecosystem is required of people, processes and technology**

Technology is a means to an end. Tech itself will not solve persistent development dilemmas, this requires an entire ecosystem: an enabling environment of people, processes and technology.

Building this eco-system should always be needs-based. To be able to introduce appropriate and relevant digital solutions, attention must be paid to the intended users of the technology (people's digital literacy, skills, know-how and capacities), the necessary infrastructure (network connectivity, mobile phone penetration, etc.), and the regulatory frameworks (on digital payments, e-commerce, data protection and ownership, etc.). Helicoptering in digital services into unprepared or unexplored contexts will not

produce desired outcomes and impact. In peripheral and conflict areas, creating a viable ecosystem is especially challenging.

2 Don't expect business-as-usual

Investors, donors and co-financing agencies should be prepared to explore uncharted territories when venturing into 'the digital world'. Innovation requires flexibility: in budgeting of the interventions, timing of implementation and deliverables, and willingness to manage different possible outcome scenarios.

One example is that data processing units are (still) often based at headquarter offices and require dedicated budgets. Yet, many funding agencies stipulate that funds must be directly allocated to and spent in the recipient countries. This creates a conflict for the financing of innovative tech interventions. On a positive note, in many countries the local capacity to design and implement successful applications

based on digital technology is fast increasing. Many innovative apps have indeed originated in countries like Kenya, India or Brazil.

3 Financial sustainability remains a challenge

How can digital technologies serve people in bottom-of-the-pyramid societies in a sustainable manner, if the users are unable to pay for these services? Even projects that achieve a wide outreach for the digital services they offer, often face challenges in terms of securing financing to meet growth aspirations.
The beauty of a free service in challenging environments is keeping it free-of-charge. On the other hand, long-term sustainability is often better served if users can contribute even a small fee (e.g. paying a premium for a health insurance rather than receiving entirely free healthcare).

But to what extent should the service then be monetised? And what are the most viable business models to put a digital innovation in

the market? Services must be affordable for the majority to be able to reach scale. Sometimes working with governments, however challenging, is an option worth investigating because of the sustainability and scaling potential this provides. Another challenge is that tech-oriented start-ups and social enterprises that use digital technologies to increase impact, may have trouble finding investors willing to provide risk capital.
Many cases presented in this publication struggle with financial sustainability but are also very flexible and inventive in finding solutions.

4 Digitalisation means different things to different people

A digital divide exists – between countries, regions within countries, men and women, young and old. Introducing automated SMS-services can be considered a ground-breaking method in one community, while others consider satellite data and deep machine

learning is the starting point for innovation. Although 'disruptive' is a word often used in relation to digital technology, relatively 'simple' process innovations can already have considerable impact. Digital anthropologist Payal Arora provides insightful perspectives on what "digital" means beyond Western views of digitalisation in her book The Next Billion Users ▶. Digital Life Beyond the West. Where Arora sees growing digital use as a potential stepping stone for users in developing countries, she also warns that conventional problems such as the power of who-you-know networks, lacking access to finance and pervasive corruption all influence the potential positive impact of digital solutions for large groups in these societies.

5 | Human rights must be protected also in the digital sphere

The Do No Harm principle is applicable in the digital realm as much as it is in 'traditional' development practice. This means

that interventions must pay attention to the potentially negative impact on people's rights by identity exposure through social media, vulnerabilities to cybercrime, new exclusion resulting from digital illiteracy, and insufficient data privacy for politically vulnerable groups such as refugees and migrants, opposition groups, LGBTQ or other minorities. Minimum requirements related to human rights are informed consent, non-discrimination and attention to gender. The human rights implications of digitalisation are being further discussed, and standards developed, by agencies such as ICNL and Access Now.

6 | Responsible data and data ethics

Data is fast becoming one of the most important resources in our global economy. This makes the responsible use of data an immediate priority. The issues and risks are plenty: unethical or illegal use of insights from, possibly biased, data analytics, information

assymmetries, lack of transparency or distrust on the part of both providers and consumers of data. There is a real risk that data is being used for purposes other than the initially stated intentions, and that the data providers would not have agreed to this, leave alone given their consent. But do they have an opportunity to decline this different use of their data?

The Overseas Development Institute (ODI) describes "data ethics" as a branch of ethics: it evaluates data practices that have the potential to adversely impact on people and society – in data collection, sharing and use.

This confirms how important it is that governments, companies and organisations alike adhere to the nine digital principles ▶ presented in the introduction. Responsible data use, in brief, implies a duty to ensure people's rights to consent, privacy, security and ownership around the information processes of collection, analysis, storage, presentation and reuse of data, while respecting the values of transparency and openness.

7 **Who regulates the digital world?**

Digital developments are taking place at an exponentially accelerating pace – too fast for traditional policy frameworks to be discussed, negotiated, formulated and implemented in a timely manner. Governments and civil society organisations are debating how to deal with this reality, especially given that data are the resource of the future.

In her book The Age of Surveillance Capitalism ▶, Harvard professor Shoshana Zuboff explores the business model that underpins the digital world, where those who can access the data (by offering their free online services), have control over what we do, how we think, what we want and where we go. Her analysis of the political economy behind the digital revolution, causes Zuboff to dismiss the idea of 'self-regulation' by tech companies such as Facebook or Google. She calls for governments and civil society to respond to the changing dynamics with eyes wide open.

The promise of digital technology

Innovative applications, in combination with investments in infrastructure and stronger institutions, help achieve the promise of digital technology in developing countries:

1 Better targeting of development interventions
2 Monitoring of process and impact in near real-time
3 Informed policy and decision-making
4 Improved transparency and increased citizen participation

If the international development community takes this warning to heart and ensures a fair and responsible application of digital technologies, then the opportunities for digitalisation to enhance development impact worldwide are plenty.

The Dutch government intends to boost its investment in this promising perspective.