

QUICK SCAN VIETNAM



June 2014



The Quick Scan for Vietnam is commissioned by the Netherlands Space Office (NSO) within the framework of the Geodata for Agriculture and Water (G4AW) program. The following organizations have contributed to this document:



TABLE OF CONTENTS

Introduction.....4

- 1 Assessment of Vietnam with a focus on agricultural issues5
 - 1.1 Main challenges in Vietnamese agro-eco systems.....5
 - 1.2 Governmental efforts and policy on food security7
- 2 Assessment of status and problems of information supply in the agricultural sector12
 - 2.1 Main challenges in information supply encountered in agricultural activities12
 - 2.2 Institutional capacity to support viable information services.....12
 - 2.2.1 General information suppliers active in agriculture domain13
 - 2.2.2 Specific agri-sector information supply and current mechanisms.....13
 - 2.2.3 Other sectors (and role of information) important for the agricultural sector14
- 3 Needs assessment of improved ICT & information supply in the agri sector15
 - 3.1 Needs assessment with a focus on potential use of spatially based information services.....15
 - 3.2 Public and private problem stakeholders and international organizations in the domain of G4AW16
 - 3.3 Ongoing G4AW relevant activities and/or projects in Vietnam16
 - 3.4 References to public domain publications.....19
- 4 Inventory of potential (chain) solutions directions using geo-ICT in local agriculture issues.....20
 - 4.1 Base solution directions in Vietnam tailored to local agricultural practices.....20
 - 4.1.1. Actual agri-spatial information services20
 - 4.1.2. Farm insurance and risk prevention strategies20
 - 4.2. Differentiation of spatial solutions tailored to agricultural practices/sector in Vietnam21
- 5. Recommendation for matchmaking/missions.....22

INTRODUCTION

Within the framework of food security policy, the Ministry of Foreign Affairs of The Netherlands is implementing the programme 'Geodata for Agriculture and Water (G4AW) Facility'. The G4AW Facility aims to increase the agricultural sector output in G4AW partner countries. This is achieved by providing food producers with relevant information, advice and/or (financial) products through operational information chains using satellite data.

In the summer of 2014, a new call for tenders will be opened. In this call, the Ministry of Foreign Affairs of The Netherlands calls for good quality project proposals from viable partnerships.

Goal of the Quick Scan

The Quick Scan serves as input for preparing the country visit and the G4AW information and matchmaking workshop in Vietnam. In the workshop the local context, constraints and challenges in agriculture will be discussed. Furthermore, the background and details of the G4AW Facility is provided and the development of partnerships is promoted.

This Quick Scan provides an up-to-date information assessment on agricultural and associated activities. It provides information from different perspectives and in a wider context (climate, water management). Additional, stakeholders from different types of organizations are identified and reported. The document is initially supporting the country visits and workshop, but the provided information can also contribute to the development of partnerships that are intending to bring forward a proposal in the second call of the G4AW Facility.

1 ASSESSMENT OF VIETNAM WITH A FOCUS ON AGRICULTURAL ISSUES

Pressure on the agro-eco production systems caused by increased (overpopulation), climate changes and extreme weather conditions lead to a lack of natural local resilience. In this section, the most important challenges in the agro-eco systems in Vietnam are given as well as an overview of (governmental) efforts to address the food security situation.

1.1 MAIN CHALLENGES IN VIETNAMESE AGRO-ECO SYSTEMS

In the following table a set of major economic data for Vietnam is presented which demonstrates the strengths of the Vietnamese economy in terms of economic growth, trade and FDI attraction. In average, the agriculture sector represents a 20% of the economic activity.

Major Economic Data for Vietnam		
Indicator	2005	2013
GDP Per capita (USD current prices)	680.0	1,550.0
GDP growth rate	8.4%	5.4%
Agriculture share of GDP (incl. forestry and fishery)	19.3%	19.7%
Exports (USD Billion)	32.0	132.0
Registered FDI (USD Billion)	5.8	22.3
Inflation Rate	8.5%	6.0%
Population	83.5 million	88.7 million

TABLE 1.1: MAJOR ECONOMIC DATA FOR VIETNAM¹

Vietnam is becoming a major player in the global trade market due to a rapid increase in exports of agricultural products like seafood, rice, coffee, rubber, cashew nuts pepper, among others. Agriculture is a very significant part of the Vietnamese economy, comprising of 20% of the GDP, 15% of Vietnam's total exports and nearly 45% of the labor force, from which the vast majority of those employed in this sector are in the rural areas. It is estimated that around 24.6 million people work in the agriculture, forestry and fishing sectors.

Agricultural land is mainly to be found in low lying regions where the soil is most fertile and in terms of rice-growing, where it can take advantage of normal flooding, bringing nutrients that increase soil fertility.

¹ Source: General Statistics Office. World Bank for GDP per capita

Products	USD Thousands
Seafood	6,717,430
Rice	2,925,222
Coffee	2,721,389
Rubber	2,492,054
Cashew nut	1,646,676
Cassava and cassava products	1,100,420
Fresh and processed vegetables and fruit	1,094,886
Pepper	889,776
Tea	229,719
Total Agriculture	19,817,572

TABLE 1.2: VIETNAM: MAIN AGRICULTURE EXPORTS (2013)²

According to Vietnam Constitution land is the property of the entire people, which is allocated or leased by the State to organizations, households or individuals for long-term use. Depending on their status, land users are fully or partly granted the rights of land exchange, transfer, inheritance, mortgage, lease and investment into joint-venture³.

Water

Water as a natural resource that can become 'compromised' is a very important, often invisible, and therefore neglected issue. A range of challenges related to water are encountered in Vietnam:

- Too much (flooding);
- Too little (drought);
- Too dirty (pollution, too much pesticides etc.).

Overpopulation, urbanization, and industrialization are factors that are influencing water as a natural resource. The main problem that these arena faces is that nobody feels responsible to pick up the 'bill' for studies assessing the situation with regard to the condition of water as a natural resource (this includes groundwater)⁴.

² Source: General Statistics Office. World Bank for GDP per capita

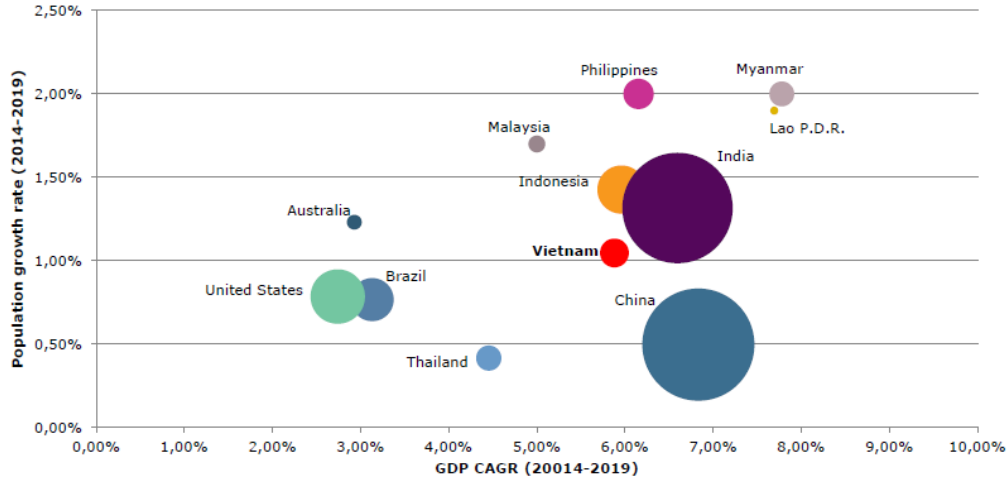
³ Source: <https://www.fig.net/pub/proceedings/korea/full-papers/pdf/session7/dang-palmkvist.pdf>

⁴ An example of this the coffee area near Buon Ma Thuot where they are facing the question if there still will be enough water for irrigation in 10 years

Large and growing population: 90 million people
 Healthy GDP growth at 6% (2003 – 2013)
 Agriculture contributes more than 20% of its GDP



Comparison of growth across several countries



Source: IMF World Economic Outlook, 2012

Note: Bubble size indicates current size of population

10

FIGURE 1.1: COMPARISON OF POPULATION GROWTH ACROSS COUNTRIES (INCLUDING GDP GROWTH)⁵

1.2 GOVERNMENTAL EFFORTS AND POLICY ON FOOD SECURITY

In the following paragraphs a general overview on the agriculture, food security and climate’s policy framework is presented. In the image below the decentralized land administration system is shown⁶.

Agriculture and Food Security

According to the Ministry of Agriculture and Rural Development (MARD) framework on food security⁷, which is largely based on rice production, the following are the main food security pillars:

- A. **To ensure food supply sources:** *“To further step up intensive rice farming, particularly in the Mekong River and Red River Deltas, creating stable supply sources for immediate- and long-term national food security. By 2020, to protect the rice land fund of 3.8 million ha for an output of 41-43 million tons of paddy to meet the total domestic consumption and export demand of around 4 million tons of rice/year”.*

The policy also includes specific targets for maize, fruits, vegetables, milk, poultry, fish and aquaculture.

- B. **To meet nutrition needs:** *“By 2020, to improve the nutrition conditions towards nutrition balance, raising the average daily calorie consumption to 2,600-2,700 kilocalorie/person and reducing the malnutrition rate among under-five children to below 5%”*

⁵ Source: Rabobank Presentation, Hanoi 17 June 2014. Vietnam: current situation and future opportunities in food & agri.

⁶ Source: http://www.fig.net/pub/fig2013/ppt/ts03a/TS03A_mitchell_6440_ppt.pdf

⁷ Source: Regulation No. 63/NQ-CP, December 2009

- C. **To ensure people's accessibility to food:** "To put an end to food shortage and hunger by 2012, ensuring that 100% of the population anywhere and anytime will be supplied with adequate food after 2012. To ensure that by 2020, the food producers' income will be 2.5 times higher than the current level".

F&A potential as a consumption market with upstream strengths in selected F&A commodities



Upstream	Strong agri production strengths in select F&A crops including larger exports Impact: <i>Coffee. Rubber. Rice. Tropical fruits. Niche vegetables</i>
Midstream	Livestock industry undergoing strong growth and industrialisation Impact: <i>Animal Protein</i>
Downstream	Strongest growth in downstream consumption sectors due to large, growing, literate, industrious, and young population with diet being westernised Impact: <i>Wheat-based. Beverage. Dairy. VAP. Animal Protein. Retail</i>
Trade	Increasing reliance on grains and oilseed imports to increase. Gradual rise of domestic F&A companies. Impact: <i>Wheat & Feed milling. Infrastructure/logistics</i>
Long term potential: <i>Southern China linkages. ASEAN Economic Community. Indochina</i>	

FIGURE 1.2:
POTENTIAL
CONSUMPTION
MARKETS FOOD &
AGRICULTURE⁸

Vietnam Decentralised Land Administration System

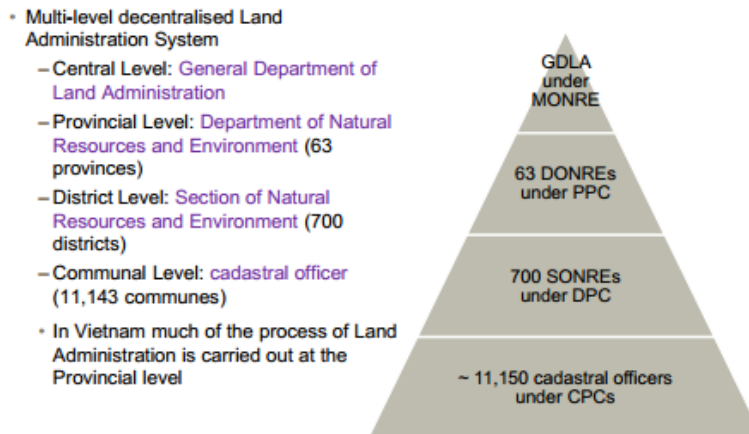


FIGURE 1.3: POTENTIAL FOR F&A LAND ADMINISTRATION SYSTEM

⁸ Source: Rabobank Presentation, Hanoi 17 June 2014. Vietnam: current situation and future opportunities in food & agri.

Agriculture and Climate

A. Strategic approach: Green Growth

The National Green Growth Strategy of Vietnam, promotes and strategic approach for sustainable growth aiming the following objectives:

- Restructure the economy and increase competitiveness through efficient use of resources and address environmental degradation
- Assess and promote the use of high technology development to increase efficiency in natural resource use, reduce GHG intensity of the economy and respond to climate change
- Improve the quality through green employment, sustainable lifestyles, green infrastructure/building and restored natural capital.

Two major population centres (Hanoi & Ho Chi Minh)

Three deep water ports - Seven agro climatic regions

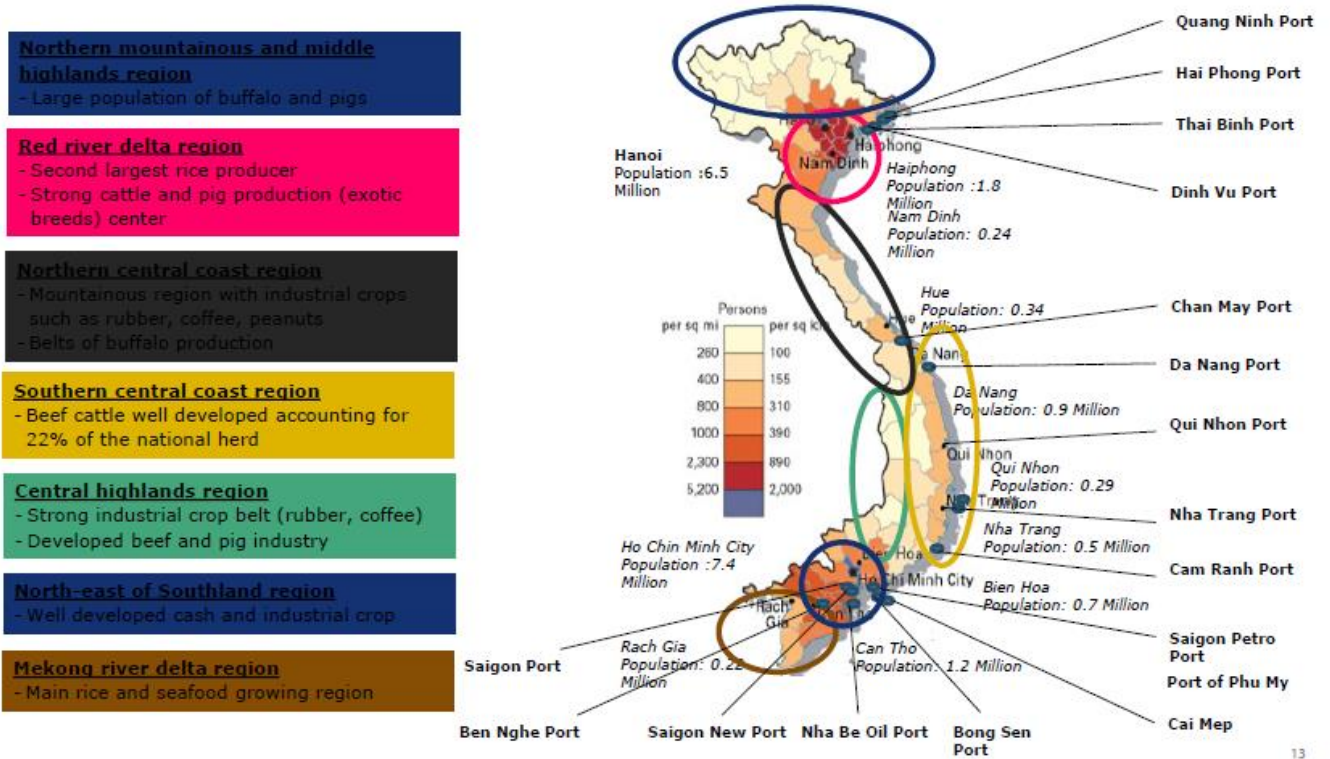


FIGURE 1.4 : THE AGRO CLIMATIC REGIONS OF VIETNAM⁹

⁹ Source: Rabobank Presentation, Hanoi 17 June 2014. Vietnam: current situation and future opportunities in food & agri.

B. Climate Change Approach

In the approval on “**National Climate Change Strategy of December 2011¹⁰**”, the government reacts to the threats towards the food security caused by climate change and other several areas including GHG emission reductions, forest protection, among others. The following strategies and plans are included this legal framework:

Strategic task 1: Proactive disaster preparedness and climate monitoring	a) Early warning b) Disaster risk reduction
Strategic task 2: Food and water security	a) Food security b) Water security
Strategic task 3: Suitable proactive response actions to sea-level rise in vulnerable areas	Research, evaluate and predict impacts and vulnerability of areas, sectors and communities to sea-level rise
Strategic task 4: Protection and sustainable development of forest, increasing carbon removals and biodiversity conservation	Accelerate the progress of afforestation and reformation projects, encourage the business sector to invest in economic forestation
Strategic task 5: GHG emission reduction to protect global climate system	a) Development of new and renewable energies b) Energy saving and efficiency c) Agriculture d) Solid waste management
Strategic task 6: Increase the role of Government in climate change response	a) Amendment and integration of climate change into other strategies and planning
Strategic task 7: Community capacity development to respond to climate change	a) Communities responding to climate change b) Improving the public health system c) Raising awareness, education and training
Strategic task 8: Scientific and technological development for climate change response	Prioritize sciences for climate change management, evaluation, monitoring, and impact prediction to socio-economic development, healthcare, production and consumption.
Strategic task 9: International cooperation and integration to enhance the Vietnam’s status in climate change issues.	Strengthen partnership with other countries and international organizations in the implementation of the UNFCCC and relevant international agreements; take proactive role in development of multilateral and bilateral agreements and treaties on climate change.
Strategic task 10: Diversification of financial resources and higher effective investment	Several areas

TABLE 1.2: LEGAL FRAMEWORK INCLUDING STRATEGIC PLANS

¹⁰ Source: Regulation No: 2139/QĐ-TTg, December 2011

C. Disaster Prevention, Response and Mitigation

Under the “**National Strategy for Natural Disaster Prevention, Response and Mitigation to 2020¹¹**”, the government aims to prevent and combat the consequences caused by disasters of climate change to the population and economic activities, as well. Especially drought is a common type of disaster in Vietnam, which causes the third greatest losses, following typhoons and floods.

Water

A. Water & Sanitation – Basic Services Access Approach

The “National Rural Clean Water Supply and Sanitation Strategy up to Year 2020¹²”

The NRWSS aims to contribute to the implementation of the Strategy for Rural Development in the period of industrialization and modernization with the following development and immediate objectives: i) Improved Health of the Rural Population; ii) Improved Living Conditions and; iii) Reduced Environmental Pollution from Human and Livestock Excreta.

B. Irrigation Approach

The Minister of Agriculture and Rural Development has recently approved the “**Restructuring Scheme of Irrigation Sector¹³**” with the following objectives:

- i. Improving efficiency of irrigation sector to contribute to agricultural restructuring towards greater added value and sustainable development;
- ii. Meeting the development requirements of socioeconomic sectors;
- iii. Building capacity for disaster prevention and response to climate change;
- iv. Contributing to modernization of agricultural and rural infrastructure and new rural development.
- v. Developing a proactive and modern irrigated agriculture and promoting advanced and water-saving irrigation solutions on a large scale for main upland crops such as coffee, pepper, tea, cashew, sugarcane, fruit trees; among others.

¹¹ Source: Regulation No. 172/2007/QĐ-TTg, November 2007

¹² Source: Decision No 104/2000/QĐ-TTg, August 2000

¹³ Source: Decision 794/QĐ-BNN-TCTL, April 2014

2 ASSESSMENT OF STATUS AND PROBLEMS OF INFORMATION SUPPLY IN THE AGRICULTURAL SECTOR

For food (and water) security programs, actual and accurate (spatial) information is crucial for land and crop production systems to provide quick indicators on the context (e.g. water availability), status (e.g. biomass, crop type, acreage, etc.) and trends (within and in between seasons, years) of local farming practices/performance. In this section, the main challenges in information supply in Vietnam are summarized as well as the institutional capacity to support viable information services.

2.1 MAIN CHALLENGES IN INFORMATION SUPPLY ENCOUNTERED IN AGRICULTURAL ACTIVITIES

The trend of joint progress toward a connected economy is a trend of the time which is also the goal for technological and institutional development. But in fact, there are still challenges encountered by not only Vietnam, including¹⁴:

- Keep the various existing information systems in general and GIS systems in particular currently managed and used by different owners but to make sure provision, distribution, sharing of data and information to the general users community is enabled;
- To accept differences in the way geo-objects are organized in GIS databases in different sectors as long as data integration to a certain extent is still possible;
- To address global, inter-regional, and cross-sector issues where there is a need for data integration that goes beyond a sector's boundary, e.g. environmental, land use planning issues;
- To address to some extent the matter of understanding by institutions and individuals in relation to data sharing; to reduce the problem of silo-management of data and information in general and geo-data and geo-information in particular;
- Spatial Data Information has not been fully concerned in Vietnam. Training institutions in Vietnam have not incorporated this in their training curricula at both graduate and post-graduate levels.
- Investment by the Government in this regard has been just inconsiderable for the development of separate specialized databases has been only started. In addition, the constraints in legal, institutional, organizational, technological and resource terms have also been a big hamper on the process in Vietnam.

2.2 INSTITUTIONAL CAPACITY TO SUPPORT VIABLE INFORMATION SERVICES

Several ministries and sectors of Vietnam have developed GIS. This achievement benefitted Vietnam in many ways. However, in the current circumstances it is necessary to have integrated data from various sources to ensure decisions made will be correct and comprehensive.

The government of Vietnam has released many policies to mandate applications of geospatial technology in agriculture which aims to transfer information to producer faster and in productive ways. In agriculture, the government pays high attention on rice production, especially in terms of flood, diseases, yield and effects of climate change on rice production. To quickly respond to the requirement of the government for rice production, we need

¹⁴ Source: https://www.fig.net/pub/vietnam/papers/ts04a/ts04a_tuan_xuan_3575.pdf

to apply geospatial technology and therefore we need the support from government to encourage all stakeholders to participate in solving the issues¹⁵.

2.2.1 GENERAL INFORMATION SUPPLIERS ACTIVE IN AGRICULTURE DOMAIN

Ministry of Natural Resources and Environment (MONRE) and Ministry of Agriculture and Rural Development (MARD) are the key ministries active in the water and food domain in Vietnam. These ministries acquire information through their extension services and field networks with their regional networks and related institutes. However the acquired information is scattered over the various institutes involved and requires a more structural central approach of data management and disclosure to other organizations.

2.2.2 SPECIFIC AGRI-SECTOR INFORMATION SUPPLY AND CURRENT MECHANISMS

Agricultural cooperatives have changed from the production-oriented management into service-oriented models. During the renovation period (from 1986), households are considered as key production unit and land allocated to farmers. These policies have played their role until now and turned Vietnam from a net food import country to the top ranking export of many commodities. And, thanks to the renovation policy, farmers are more interested in new technologies, because they are allowed to produce whatever they want. Apart from that, there is also increasing investment in improving infrastructure, especially in water resource works and irrigation capacity; and strengthening science and technology, especially in breeding new crops varieties and animal breeds.

The Vietnam Academy of Agricultural Sciences works with geospatial technologies assist in land evaluation in different scales (national, regional, provincial and district) for proposing suitable land use planning/agricultural development; development of Geographical Indicator (GI) for traditional indigenous crops; and assessing nutrient demands for promoting efficient regional fertilizer-use management. Web maps are used for transferring fertilizer recommendation to farmers, fertilizer traders, fertilizer producers and administrators; and remote sensing and geostatistic for identifying geographic hotspots of human-induced land degradation in Vietnam and their social-ecological types¹⁶.

¹⁵ Interview with Nguyen Van Bo, President of the Vietnam Academy of Agricultural Sciences:
<http://www.geospatialworld.net/Interview/ViewInterview.aspx?id=30664>

¹⁶ Interview with Nguyen Van Bo, President of the Vietnam Academy of Agricultural Sciences:
<http://www.geospatialworld.net/Interview/ViewInterview.aspx?id=30664>

2.2.3 OTHER SECTORS (AND ROLE OF INFORMATION) IMPORTANT FOR THE AGRICULTURAL SECTOR

Mobile subscriptions in Vietnam: An Overview

According to the Telecommunication Development Sector (ITU-D), a United Nations agency¹⁷, Vietnam presents one of the highest mobile penetration rates in the region, as shown in the following table¹⁸:

Vietnam	Mobile/cellular subscriptions	Subscriptions per 100 inhabitants
Vietnam	134,066,000	147.66
Cambodia	19,105,115	128.53
Indonesia	281,963,665	114.22
Lao	4,300,000	64.7
Asia & Pacific	3,604,000,000	89.2

TABLE 1.3: MOBILE PENETRATION RATE

The penetration rate in Vietnam is almost twice the regional average, which demonstrates a comparative advantage in terms of potential outreach, impact and scalability for initiatives like the G4AW Facility. However, according to the same source¹⁹, the wireless broadband penetration rate is less than 10% of the population, especially in rural areas.

¹⁷ Source: <http://www.itu.int/en/ITU-D/Pages/About.aspx>

¹⁸ Source: <http://www.itu.int/>

¹⁹ Vietnam Wireless Broadband Masterplan Until 2022, Telecommunication Development Sector (ITU-D), October 2012. Source: http://www.itu.int/ITU-D/tech/broadband_networks/WirelessBDMasterPlans_ASP/WBB_MasterPlan_VietNam.pdf

3 NEEDS ASSESSMENT OF IMPROVED ICT & INFORMATION SUPPLY IN THE AGRI SECTOR

In this section, an inventory of specific needs and problems in the information supply (and demand) in the Vietnamese agri sector is provided. The most important local stakeholders represented in the identified problem domains are selected (short list). Furthermore, additional stakeholders in related domains need to be selected (e.g. water domain, nature, industry, etc.).

3.1 NEEDS ASSESSMENT WITH A FOCUS ON POTENTIAL USE OF SPATIALLY BASED INFORMATION SERVICES

One of the most important ingredients for sustainable spatial planning, especially in densely populated countries such as Vietnam which mainly rely on agriculture, is effective knowledge about (future) water availability and water behavior.

Notably the dynamic character (in space and time) of water creates difficulties. Rainfall, droughts, evaporation, subterranean storage, runoff, flooding, salt intrusion, storm surges, waves and tidal currents, all these dynamic water processes are intimately linked with land topography, and formation, vegetation potential, land use, agricultural output, and survival during flooding. Water behavior deeply affects land use, and vice versa. At the same time manmade changes in land infrastructure, and for sure changes in climate, have an effect on the behavior of water and as a consequence on the usability of land. The challenge, all over the world and especially in Vietnam, is to better understand the locally defined iterative processes of water behavior and economic land use, and to turn this knowledge into sustained economic growth. Instrumental to achieve this is the social factor: man's behavior and actions. Effective actions would imply having access to all relevant data, and understanding all relevant processes, which obviously describes a distant ideal situation.

A formidable step forward is the recent availability of extensive, wide scoped and detailed geo-information using remote sensing techniques, both satellite and airborne based. For this rich data source to become a cost-effective means for planning and decision making, it must be coupled with powerful models covering the relevant water- and land related issues²⁰.

²⁰ Source: Geomatics Business Park: <http://www.pandoro.nl/downloads/geovietnam.pdf>

3.2 PUBLIC AND PRIVATE PROBLEM STAKEHOLDERS AND INTERNATIONAL ORGANIZATIONS IN THE DOMAIN OF G4AW

<i>Organization</i>	<i>Description</i>
Ministry of Agriculture and Rural Development	MARD include several departments related to the agriculture, water management resources like Aqua Exploiting and Protection Department, Water Resource Department, Dyke Management and Flood Control Department; among others.
Ministry of Natural Resources and Environment	MonRE include areas and departments and agencies like Agency for Water Resources Management, Agency for Meteorology Climate Change, Agency for Survey and Mapping, Agency for Remote Sensing.
InfoAgro - IPSARD/ MARD	As part of IPSARD, INFOAGRO provides market information and market intelligence, including prices and trends for several commodities and products.
National Institute of Agricultural Planning and Projection (NIAPP) / MARD	One of the main research centre addressing GIS and remote sensing in the agriculture sector.
IFC	IFC helps increase access to finance for small and medium enterprises, which contribute 40 percent to the Vietnam's gross domestic product. It also includes mechanisms to increase access to finance in the agriculture sector.
FAO	FAO Viet Nam strives for inclusive growth in Viet Nam where resilient food and agriculture approaches become competitive and contribute to an economically viable and an environmentally sustainable society.
IFAD	IFAD works for and with the poorest people in Viet Nam, including ethnic minorities, small-scale farmers and households headed by women. Strategies to reduce poverty and improve living conditions include building partnerships, strengthening institutional capacity and promoting participation.
Agribank - Vietnam Bank for Agriculture and Rural Development	Agribank is the biggest bank in Viet Nam in terms of fund resources, assets, agricultural and rural financial market, serving agriculture, farmers and rural areas.
Bao Minh Insurance Company and Bao Viet Insurance Company	Major local insurance companies
Viettel, Vinaphone, Mobiphone	Major telecommunication companies
Space Technology Institute ²¹	Remote Sensing Technology, GIS, GPS Remote Sensing Applications Centre for Small Satellite Control and Exploitation

TABLE 1.4: OVERVIEW OF THE MAIN STAKEHOLDERS

3.3 ONGOING G4AW RELEVANT ACTIVITIES AND/OR PROJECTS IN VIETNAM

National Institute of Agricultural Planning and Projection (NIAPP) / MARD²²

The main tasks of NIAPP are to:

- Investigate and assess agriculture-related resources (water and land resources, climate, etc.) in order to set up land use options at various levels ranging from provincial, district to commune levels;
- Formulate strategic plans for agricultural development, plan and design and for formulate projects for rural investment;
- Formulate sector projects (such as sector review on agriculture, strategy on sector commodity, crop, livestock);
- Plan target commodity production areas and formulate projects on settlement, fixed cultivation and development of new economic zones;

²¹ List of projects: <http://www.sti.vast.ac.vn/en/science-and-technology-research-projects>

²² Source: <http://www.rsc-niapp.com/>

- e) Apply the Geographical Information System (GIS) to establish thematic agricultural maps; f) study policies pertaining to agriculture; g) organize international and domestic seminars and workshops on agriculture and rural aspects.

AgroInfo- Institute of Policy and Strategy for Agriculture and Rural Development (IPSARD) - MARD

The Information Center for Agriculture and Rural Development (AGROINFO) applies modern research, analysis and multimedia communication tools to serve as a bridge linking analysis with practice, and provides consistent, useful and timely information as well as in-depth analyses to support different stakeholders such as farmers, leaders, experts, and businessmen.

Irrigated Agriculture Improvement Project – MARD/ World Bank (2014)

"Irrigated Agriculture Improvement Project" will be implemented by MARD with the aim of supporting sustainable agriculture and rural development with response to climate change, enhancing competitiveness and added value of irrigated agricultural production under the National Target Program on New Rural Development and Agricultural Restructuring Project for several Northern mountainous and Central provinces, which have difficult economic conditions and slow development rate. The Project includes 4 components: Institutions and policies in support of State management improvement; Irrigation system upgrade; Support for climate-smart agriculture; Project management, monitoring and evaluation. Upon completion, the Project will provide better irrigation services for 83.400 hectares of arable land.

Ministry of Agriculture and Rural Development / Agricultural Public-Private Partnership (PPP) Task Force

At the World Economic Forum (WEF) on East Asia 2010, the enterprises, multinational corporations and companies of WEF related to agriculture agreed to establish the "Agricultural Public-Private Partnership Task Force" for the cause of the development of sustainable agricultural growth in Vietnam. Currently 5 commodity groups including fruits and vegetables, coffee, tea, seafood and general merchandise are developing effectively with the new process of production, certification and consumption, increasing productivity, output and added value.

The model also focuses on strengthening the capacity of farming techniques, nutrition, plant diseases, use of fertilizers and pesticides, seed use, market and GAP practices to enable farmers to participate in the model. Besides, new farming methods for emission reduction and water-saving irrigation have also been tested and replicated.

Vietnam Academy of Agricultural Sciences (VAAS) - Geospatial technology in the agriculture sector

According to secondary information²³ VAAS is applying GIS systems for GEO-statistics, interpolation and modeling; GPS for samples collection; remote sensing for location mapping; and web map for information dissemination. Geospatial technologies is also used in land evaluation in different scales (national, regional, provincial and district) for proposing suitable land use planning/agricultural development; development of Geographical Indicator (GI) for traditional indigenous crops; and assessing nutrient demands for promoting efficient regional fertilizer-use management.

FAO - Climate Smart Agriculture: Capturing synergies between mitigation, adaptation, and food security GCP/INT/139/EC²⁴

Food security, climate change adaptation and mitigation intersect in the agriculture sector. The Project examines them together in order to capture multiple benefits and manage trade-offs across these challenges. The Project builds an evidence base to support identification of:

²³ Source: <http://www.geospatialworld.net/Interview/ViewInterview.aspx?id=30664>

²⁴ Source: http://www.fao.org/asiapacific/vietnam/projects/detail/en/?project_uid=33

- Climate smart agricultural practices/technologies and barriers to their adoption by smallholder farmers
- Policy and institutional options that could promote their uptake, including local institutional arrangements.
- Investment proposals that cost and prioritize promising climate smart agricultural options, linking proposals to possible financing (ODA and climate)

IFAD - Project for Adaptation to Climate Change in the Mekong Delta in Ben Tre and Tra Vinh Provinces²⁵

The project is to be implemented in two provinces in the north-east Mekong Delta Region of Viet Nam. Thirty communes have been selected in each province based on their poverty ranking, vulnerability to climate change and overlap with communes covered by the government's National Target Programme on New Rural Development.

Remote sensing-based information and insurance for crops in emerging economies (RIICE) / Swiss Agency for Development and Cooperation (SDC)

RIICE²⁶ is a global public-private-partnership project operating in seven major rice-growing countries in Asia: Bangladesh, Cambodia, India, Indonesia, the Philippines, Thailand and Vietnam.

The project aims to reduce vulnerability of smallholder rice producers in two ways: (i) improving the information on rice growth areas and expected yields for better monitoring and management of rice production and (ii) providing remote sensing-based tools for crop insurance solutions.

Among the expected results a mapping system will be developed for the generation of i) a baseline rice extent map and ii) rice production figures (including area, yield, planting time and damages due to flood and drought) in the selected areas.

IDH – Sustainable Trade Initiative²⁷

IDH accelerates and up-scales sustainable trade by building impact oriented coalitions of front running multinationals, civil society organizations, governments and other stakeholders. Through convening public and private interests, strengths and knowledge, IDH programs help create shared value for all partners. In Vietnam, IDH works with different partners promoting sustainable crop production in different value chains, including coffee, pepper and aquaculture, among others.

Silva Carbon Program - USAID

SilvaCarbon is a flagship program under United States fast start financing for REDD+ and is a U.S. contribution to the Forest Carbon Tracking task of the intergovernmental Group on Earth Observations (GEO). Several activities are being conducted in Vietnam supporting REDD+ initiatives.

FOMIS - Development of Management Information Systems for the Forestry Sector – Finland Embassy

Two of the main objectives of this project are i) Establish regulations and procedures for managing, updating, and sharing of information between forestry units as basis for operations and for linking of forestry information systems and ii) Carry out design and establishment of forestry information systems databases and software.

Program for the Development and Modernization of Land Administration

²⁵ Source: http://operations.ifad.org/web/ifad/operations/country/project/tags/viet_nam/1664/project_overview

²⁶ Source: <http://www.riice.org/>

²⁷ Source: <http://www.idhsustainabletrade.com/about-idh>

The program for the Development and Modernization of Land Administration for 2005-2020 and the Strategy for Information.

Technology Application and Development for the Management of Natural Resources and Environment

Technology Application and Development for the Management of Natural Resources and Environment to 2015 and towards 2020 were approved.

Maps

A road map for the development of an NSDI for sustainable development in Vietnam has been created. Additional, topographic maps have been created in digital format to cover the whole country. Vietnam has given priority to developing a comprehensive land information system policy.

3.4 REFERENCES TO PUBLIC DOMAIN PUBLICATIONS

- Land-use change, food security and climate change in Vietnam. A global-to-local modeling approach: https://www.google.nl/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=0CCKQFjAB&url=http%3A%2F%2Fwww.wageningenur.nl%2Fupload_mm%2F5%2Fc%2F2%2Fe244a034-5b8b-47e9-8add-237d20f8fef4_2012-063%2520vDijk_WEB_DEF.pdf&ei=aeaaU-etDIPhOu7GgKgM&usg=AFQjCNFvZUMaiskPdovD1j--q4AkJc2KxQ&sig2=iiMAwkBczPisNzI7jVghw&bvm=bv.68911936,d.ZWU
- How an effective Spatial Data Infrastructure can support Land Administration in Vietnam: http://www.fig.net/pub/fig2013/ppt/ts03a/TS03A_mitchell_6440_ppt.pdf
- Development Strategy of National Spatial Data Infrastructure for Vietnam: <http://www.asiageospatialforum.org/2012/proceeding/Hoang%20Lam%20Son.pdf>
- Mekong Delta Plan - Long-term vision and strategy for a safe, prosperous and sustainable delta: http://www.wageningenur.nl/upload_mm/2/c/3/b5f2e669-cb48-4ed7-afb6-682f5216fe7d_mekong.pdf
- Vietnam – Netherlands Partnership ‘Water for Food & Ecosystems’ (June 2009) <http://edepot.wur.nl/8829>

4 INVENTORY OF POTENTIAL (CHAIN) SOLUTIONS DIRECTIONS USING GEO-ICT IN LOCAL AGRICULTURE ISSUES

4.1 BASE SOLUTION DIRECTIONS IN VIETNAM TAILORED TO LOCAL AGRICULTURAL PRACTICES

All Vietnamese institutes related to MONRE and MARD struggle with poor infrastructure (hardware, software, lack of good access to primary data) and modest Human Resources capacity. Data are scattered through many institutes and it is unclear what data are available. There seems to be a need for institutional reform and new data centers to improve access to (free available) space borne and geographical data. These centers should integrate information from various disciplines and data acquisition from the networks of the ministries and their related institutes into open data bases in support of national and regional programmes

4.1.1. ACTUAL AGRI-SPATIAL INFORMATION SERVICES

Challenges related to land use and planning

As mentioned before in section 2.1 there is a lack of structured information and data management. A well organised (open) data base which is centrally maintained and updated will help in developing and support various programmes of the government regarding agriculture programmes. E.g. an integrated multi-sector (spatial) information base is very important to land use and planning activities in the various Vietnamese provinces. Specifically to monitor and follow for example the deforestation process due to agriculture expansion or to evaluate the progress of the implementation of governmental policies in land use.

Challenges related to water management and agriculture sector

In the agriculture sector coffee in the Dak Lak Province is an important crop, which requires guaranteed access to water. The crop water demands can be monitored using remote sensing and spatial information on water availability through combined use of hydrological modelling and validation by field measurements. An integrated information and monitoring system could help the coffee sector prevent structural damage of the coffee plants by anticipating in time on droughts.

4.1.2. FARM INSURANCE AND RISK PREVENTION STRATEGIES

Challenges related to efficient crop insurance mechanisms:

As just mentioned for capital intensive cropping systems like coffee there is a need for prevention strategies for damage by drought or water excess affecting the cropping systems. Remote sensing could supply active indicators on deviations from yearly and seasonal trends on production and growth performance of cropping systems. These indicators could help in timely taking measures and in managing the crops on one hand but also to develop a risk indicator system over time, which helps in spatial differentiation of (recurring) problems. These risk indicators can be used to take structural measures in agricultural planning of crops (land evaluation) but even more in addressing risks for example using crop insurance mechanisms, which help the farmer overcome difficult periods in times of severe droughts.

With the same monitoring information rice monitoring and production performance can be assessed on various scale levels (commune, district levels). And with that also support local agri-statistics or field data acquisition for agriculture census or measurements as remote sensing data can overview large areas and has the capability to extrapolate and average information in a rapid manner.

Challenges to address climate change risks in the agriculture sector

Combined use of early warning models, remote sensing and hydrological modelling validated with local data from field measurements it becomes possible to address climate change adaptation in prone areas: flooded areas in river deltas affecting rice crops and other crops.

4.2. DIFFERENTIATION OF SPATIAL SOLUTIONS TAILORED TO AGRICULTURAL PRACTICES/SECTOR IN VIETNAM

Differentiation will follow after the matchmaking missions and meeting with specific stakeholders in Vietnam.

5. RECOMMENDATION FOR MATCHMAKING/MISSIONS

The following areas or themes represent potential opportunities for the 2014-2015 G4AW Facility, based on the initiatives, the bottlenecks or constrains in the agriculture and water sectors:

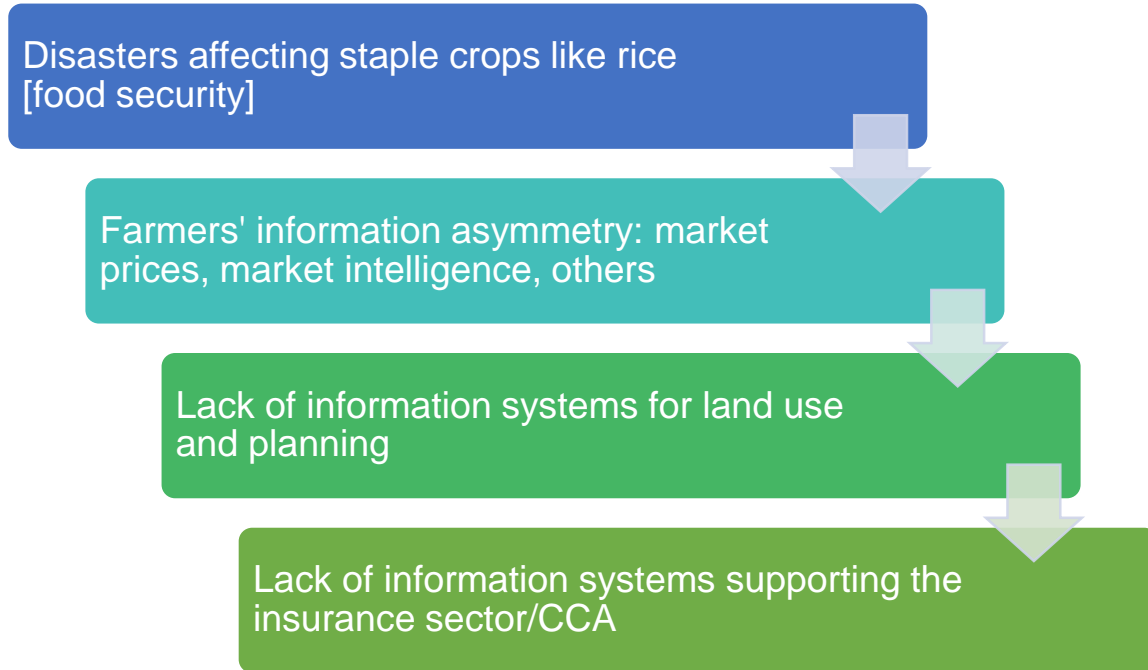


FIGURE 1.5: POTENTIAL OPPORTUNITIES FOR THE G4AW FACILITY (2014-2015)