

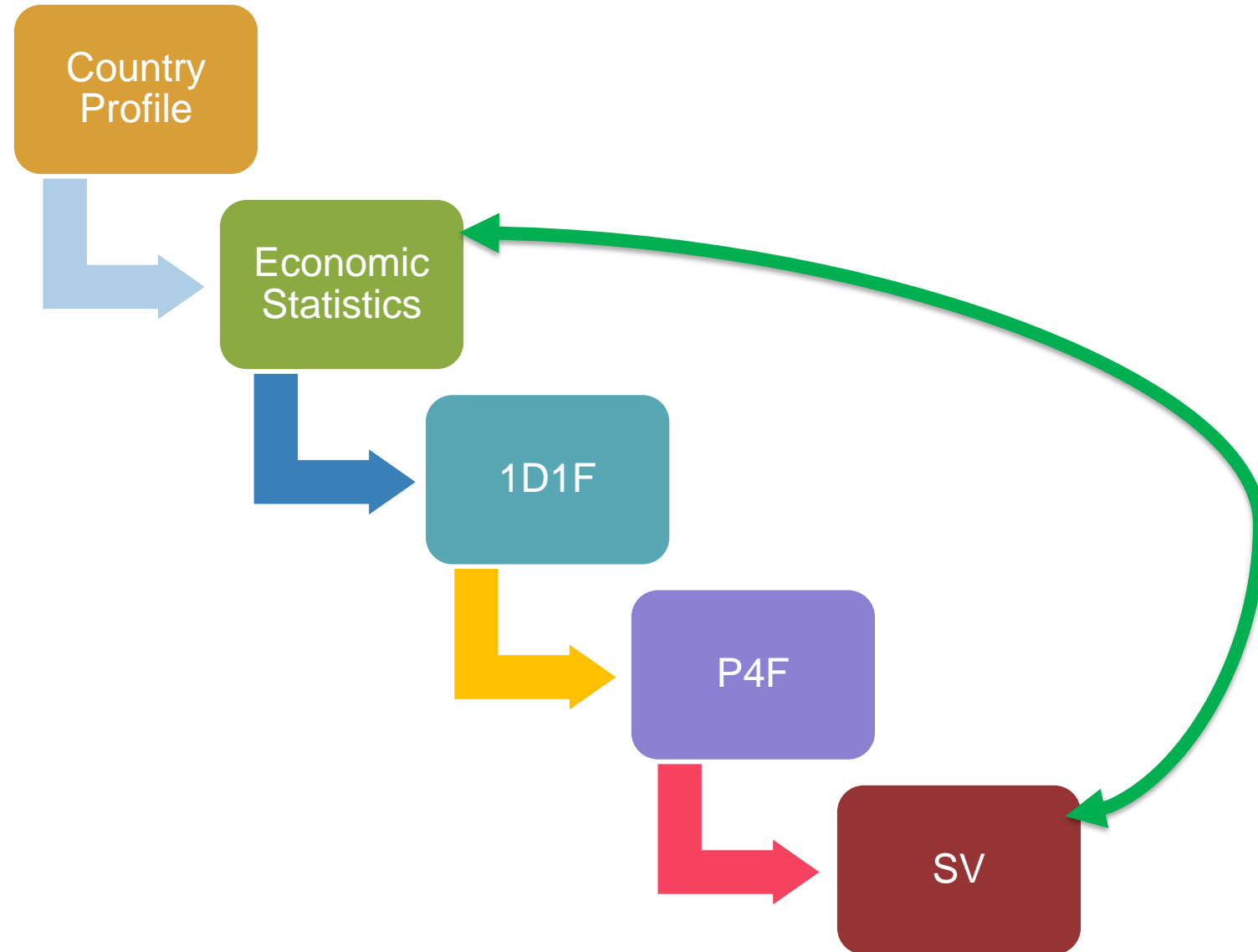
Ghana 4.0



Towards Economic & Industrial Prosperity
1D1F . P4F . Smart Villages

Edwin Opare . PhD Researcher . KAIST

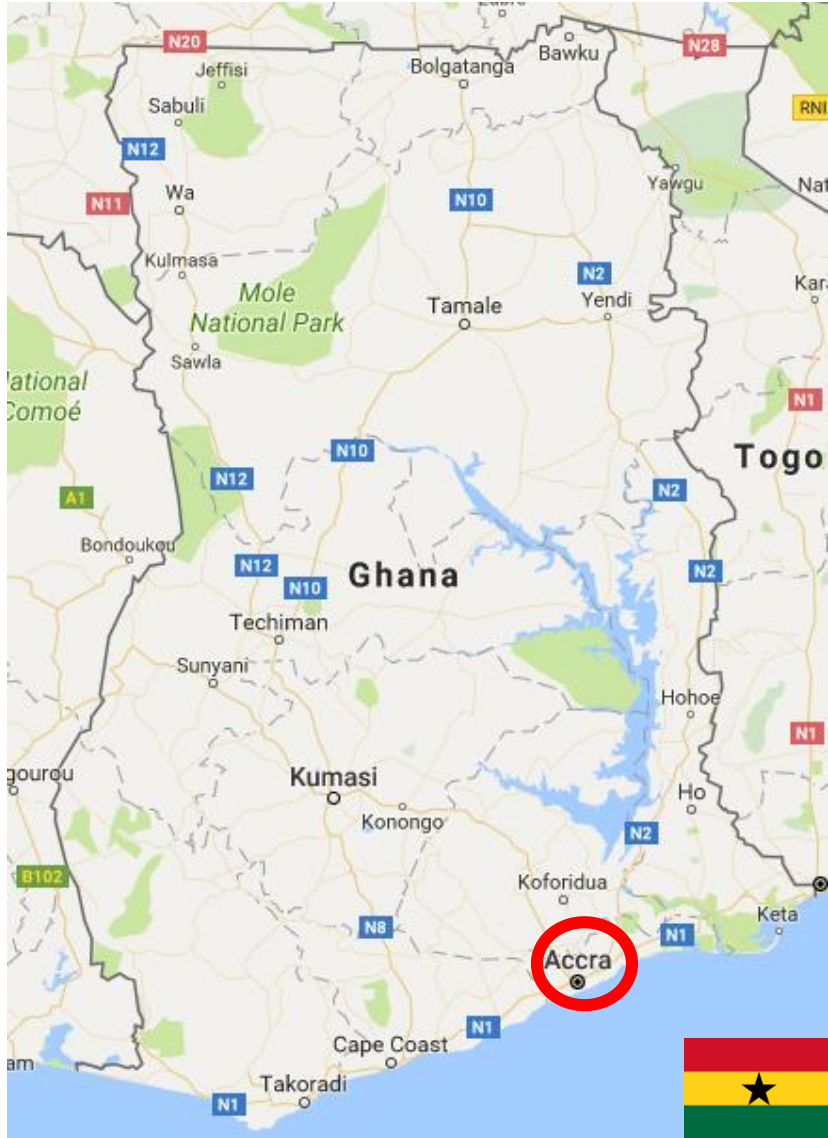
Overview



1.

Country Profile

Country Profile



Item	Key Stats
Country	Republic of Ghana
Capital	Accra
Admin Regions	10
Admin Districts	216
Population Est. (2016)	28.21 Million
Pop. Growth Rate	2.3%
Land Area	238,842Km ²
GDP(Nominal, 2016)	\$42.69 billion
GDP (PPP, 2016)	\$1,513.46
Principal Agric Exports	Cocoa, Timber, Horticultural Products, Fish/Sea Foods
Principal Agric Imports	Wheat, Rice, Chicken (frozen), Milk, Fish
Principal Mineral Resources	Petroleum, Gold, Bauxite, Manganese & Diamond

Country Profile

Type of Land Use	Hectares	(%)
1.0 Total Land Area (T.L.A.)	23,884,245	100.00
2.0 Agric. Land Area (A.L.A.)	13,600,000	56.94
2.1 Area under cultivation (2015)	6,421,450	47.22
2.1.1 Total area under irrigation (2015)	221,000	3.44
3.0 Area under inland waters	1,100,000	4.60
4.0 Others (forest reserves, savannah Woodland etc.)	8,746,021	36.60

Source: Ministry of Food And Agriculture, 2016

2.

Economic Statistics

Economic Statistics

Fig.1 Total debt as percentage of GDP, 2000–14

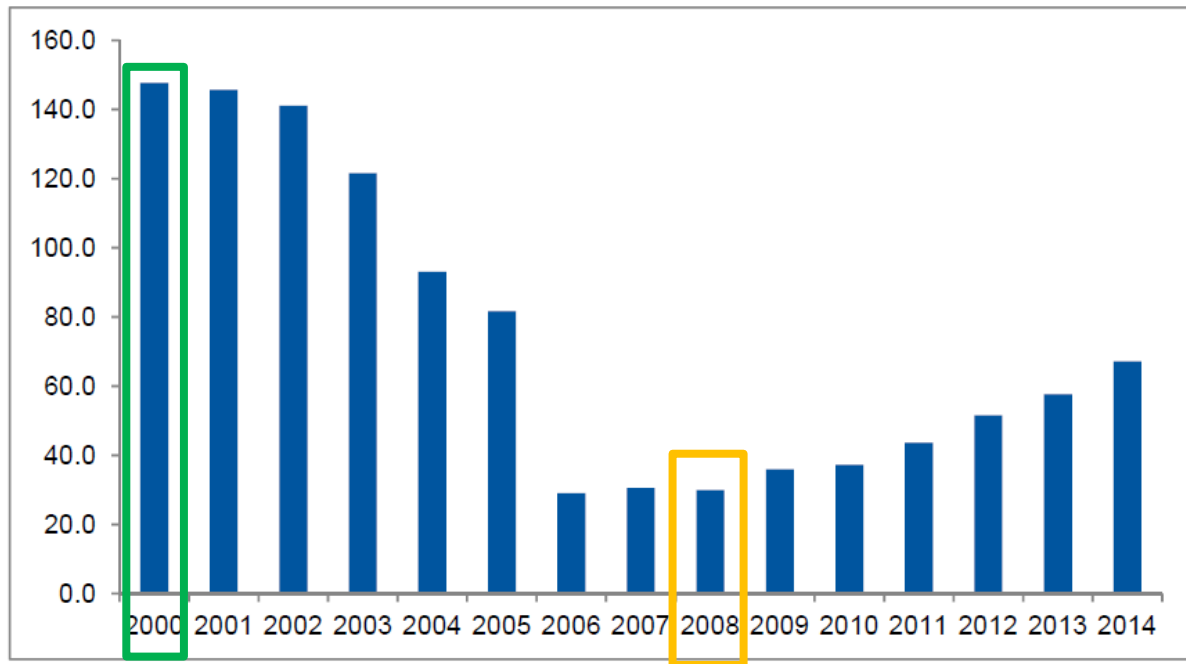
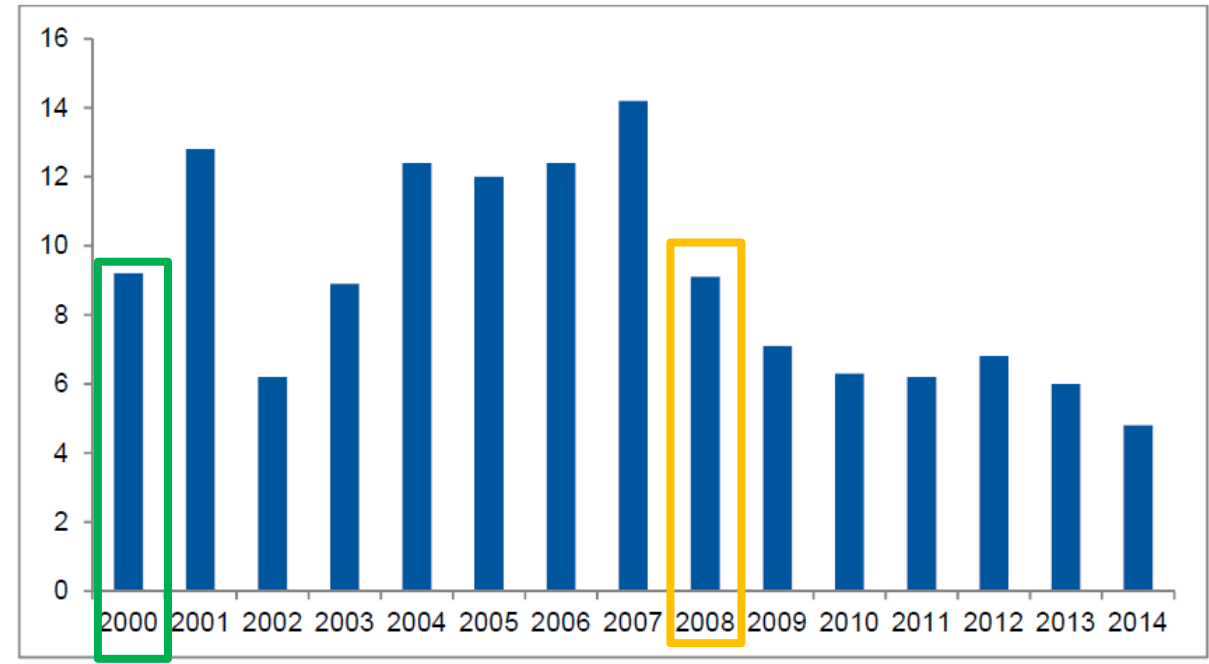


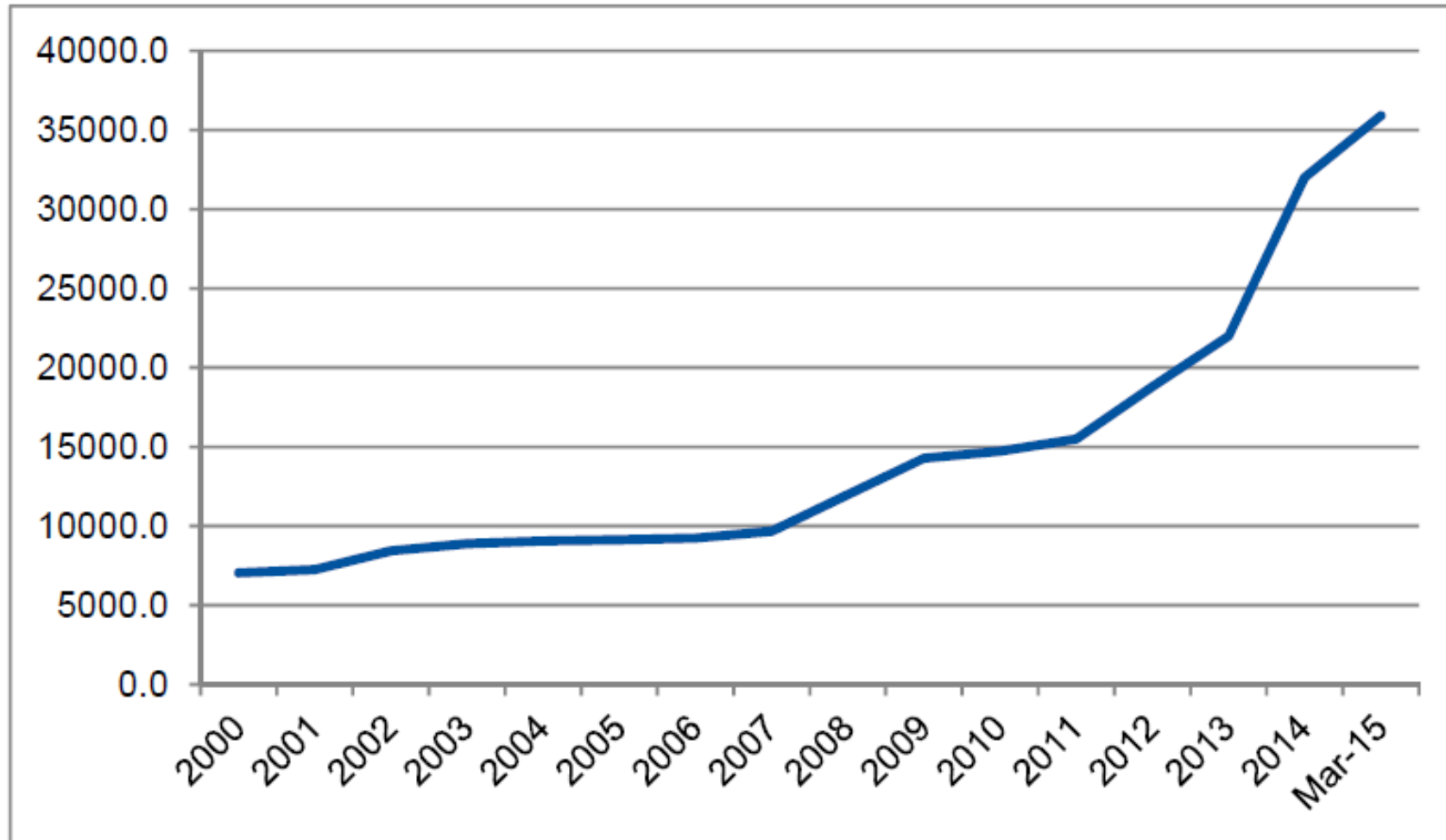
Fig.2 Capital expenditure as percentage of GDP, 2000–14



Source: Ministry of Finance and Economic Planning, 2016

Economic Statistics

Fig3. Exchange rate, cedi to US dollar, 2000 to early 2015



Source: Bank of Ghana, 2016

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
1. AGRICULTURE	30.4	29.1	31.0	31.8	29.8	25.3	22.9	22.4	21.5	20.3	18.9
1.01 Crops	21.3	20.3	22.4	23.6	21.7	19.1	17.2	17.4	16.8	15.7	14.5
<i>a.w. Cocoa</i>	3.0	2.7	2.5	2.5	3.2	3.6	2.6	2.2	2.2	1.8	1.7
1.02 Livestock	2.5	2.3	2.1	2.0	2.0	1.8	1.6	1.4	1.2	1.2	1.2
1.03 Forestry and Logging	4.1	4.2	3.7	3.7	3.7	2.8	2.6	2.2	2.3	2.3	2.1
1.04 Fishing	2.5	2.3	2.7	2.5	2.3	1.7	1.5	1.4	1.2	1.2	1.1
2. INDUSTRY	20.8	20.7	20.4	19.0	19.1	25.6	28.0	27.8	26.6	25.1	24.3
2.01 Mining and Quarrying	2.8	2.8	2.4	2.1	2.3	8.4	9.5	9.4	8.0	5.3	4.2
<i>a.w. Oil***</i>	0.0	0.0	0.0	0.0	0.4	6.7	7.7	8.2	7.2	4.1	2.1
2.02 Manufacturing	10.2	9.1	7.9	6.9	6.8	6.9	5.8	5.3	4.9	4.8	4.6
2.03 Electricity	0.8	0.6	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.9	1.1
2.04 Water and Sewerage	1.3	1.0	0.8	0.7	0.8	0.8	0.7	0.6	0.5	0.6	0.5
2.05 Construction	5.7	7.2	8.7	8.8	8.5	8.9	11.5	12.0	12.7	13.5	13.7
3. SERVICES	48.8	50.2	48.6	49.2	51.1	49.1	49.1	49.8	51.9	54.6	56.8
3.01 Trade; Repair Of Vehicles, Household Goods	6.4	6.1	6.0	5.9	6.2	5.9	5.6	5.8	5.6	6.1	6.4
3.02 Hotels and Restaurants	5.0	5.6	6.0	6.2	6.0	5.4	4.8	5.8	5.6	5.8	5.9
3.03 Transport and Storage	13.2	13.1	11.4	10.5	10.6	10.7	11.0	11.2	12.3	13.0	13.3
3.04 Information and communication	2.7	2.4	2.2	1.8	1.9	1.8	2.2	1.7	2.3	2.7	3.3
3.05 Financial and Insurance Activities	2.7	3.4	3.8	4.3	5.2	4.4	4.7	6.5	8.4	8.9	9.4
3.06 Real Estate, Professional, Administrative & Support Service activities	5.1	4.7	4.1	4.1	4.5	4.6	4.8	3.9	3.6	3.9	4.0
3.07 Public Administration & Defence; Social Security	4.8	5.9	6.3	7.0	7.0	7.0	6.8	5.9	5.4	5.3	5.4
3.08 Education	3.7	3.9	3.9	4.2	4.3	4.1	4.3	3.6	3.6	3.7	4.0
3.09 Health And Social Work	1.4	1.4	1.3	1.4	1.6	1.3	1.3	1.1	1.0	1.2	1.4
3.10 Community, Social & Personal Service Activities	3.7	3.7	3.6	3.7	4.0	3.9	3.7	4.3	4.1	3.8	3.7
4. GROSS DOMESTIC PRODUCT at basic prices	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 1: GDP Contribution by Sector

Source: Ghana Statistical Service, 2017

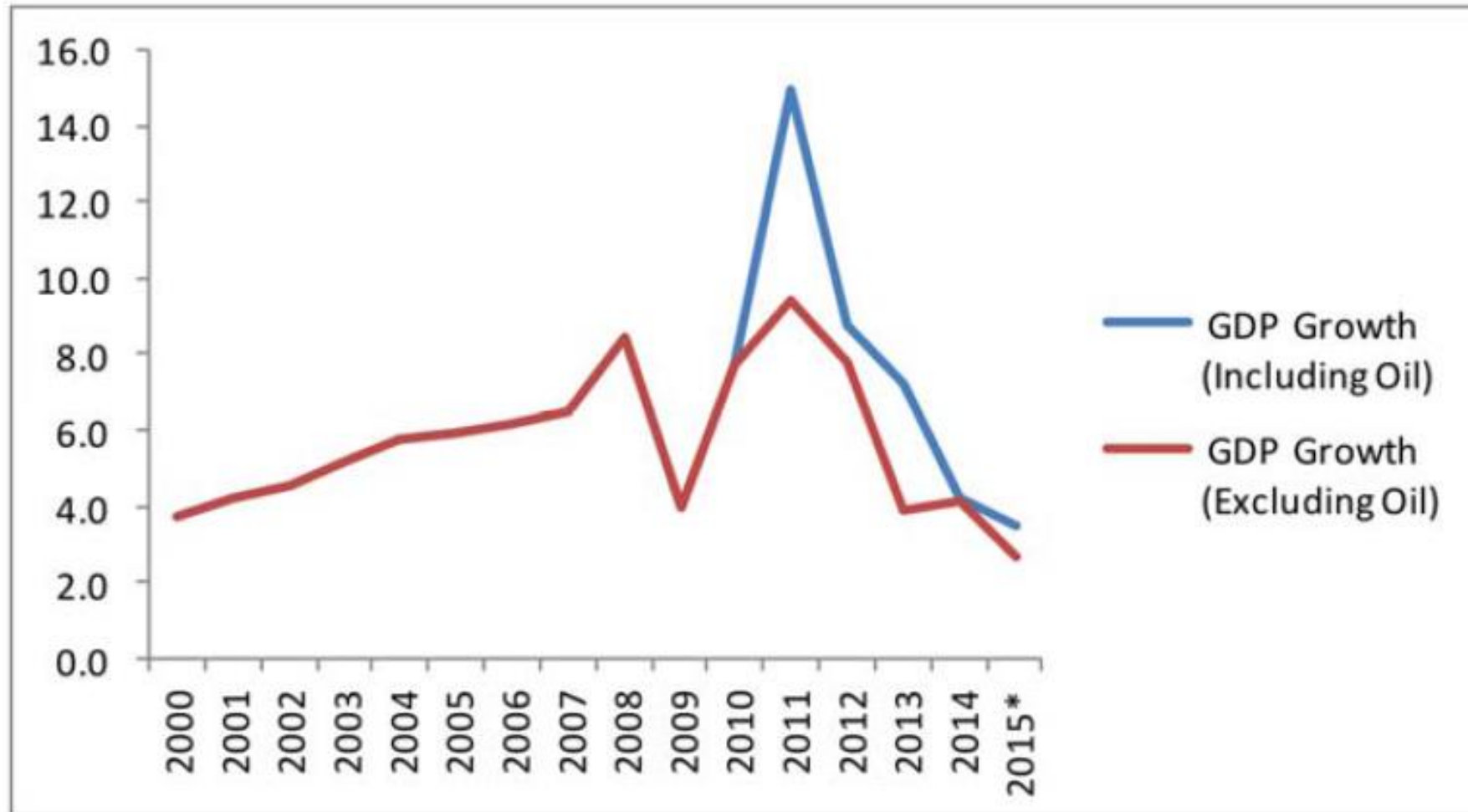
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016*
1.	AGRICULTURE	-1.7	7.4	7.2	5.3	0.8	2.3	5.7	4.6	2.8	3.0
1.01	Crops	-1.3	8.6	10.2	5.0	3.7	0.8	5.9	5.7	2.5	2.5
	<i>o.w. Cocoa</i>	-8.2	3.2	5.0	26.6	14.0	-9.5	2.6	4.3	-8.0	-7.0
1.02	Livestock	4.7	5.1	4.4	4.6	5.1	5.2	5.3	5.3	5.3	5.3
1.03	Forestry and Logging	-4.1	-3.3	0.7	10.1	-14.0	6.8	4.6	3.8	1.4	2.5
1.04	Fishing	-7.2	17.4	-5.7	1.5	-8.7	9.1	5.7	-5.6	4.3	5.7
2.	INDUSTRY	6.1	15.1	4.5	6.9	41.6	11.0	6.6	0.8	-0.3	-0.5
2.01	Mining and Quarrying	6.9	2.4	6.8	18.8	206.5	16.4	11.6	3.2	-6.1	-7.6
	<i>o.w. Oil***</i>	-	-				21.6	18.0	4.5	0.9	-16.9
2.02	Manufacturing	-1.2	3.7	-1.3	7.6	17.0	2.0	-0.5	-0.8	2.2	2.7
2.03	Electricity	-17.2	19.4	7.5	12.3	-0.8	11.1	16.3	0.3	-10.2	11.7
2.04	Water and Sewerage	1.2	0.8	7.7	5.3	2.9	2.2	-1.6	-1.1	20.0	-3.2
2.05	Construction	23.1	39.0	9.3	2.5	17.2	16.4	8.6	0.0	2.2	2.9
3.	SERVICES	7.7	8.0	5.6	9.8	9.4	12.1	10.0	5.6	6.3	5.7
3.01	Trade; Repair of Vehicles, Household Goods	5.4	9.5	5.4	13.3	11.0	11.3	14.5	1.6	9.7	3.1
3.02	Hotels and Restaurants	2.5	9.1	-3.8	2.7	3.6	5.7	24.6	-1.2	1.5	0.9
3.03	Transport and Storage	9.2	3.8	4.4	8.0	11.0	9.2	-0.5	0.3	3.0	2.2
3.04	Information and communication	4.1	19.5	3.9	24.5	17.0	41.5	24.3	38.4	21.6	21.7
3.05	Financial and Insurance Activities	18.4	10.8	9.3	16.7	1.0	21.9	23.2	22.9	3.5	3.6
3.06	Real Estate, Professional, Administrative & Support Service	3.2	0.0	0.2	13.9	14.0	18.3	-17.5	-1.5	7.7	3.8
3.07	Public Administration & Defence; Social Security	11.3	12.7	11.7	3.4	7.4	4.2	8.4	-4.7	1.4	2.2
3.08	Education	10.0	13.0	12.4	5.3	3.8	6.7	6.9	7.1	7.9	8.3
3.09	Health and Social Work	3.8	4.4	15.2	11.2	5.0	10.9	7.8	-1.7	15.7	16.8
3.10	Community, Social & Personal Service Activities	8.9	9.2	7.5	10.8	12.9	4.2	36.5	-1.6	-6.4	-5.2
	FISIM (Financial Intermediation Services Indirectly Measured)**	10.8	16.1	41.4	7.9	13.4	12.4	29.5	6.0	2.5	-0.6
4.	GROSS DOMESTIC PRODUCT at basic prices	4.3	9.1	4.8	7.9	14.0	9.3	7.3	4.0	3.8	3.7

Table 2: Sector Growth Rates at Constant 2006 Prices (percent)

Source: Ghana Statistical Service, 2017

Economic Statistics

Fig. 4 Real GDP growth (per cent), 2000–15



3.

One District One Factory (1D1F)

One District One Factory (1D1F)

Started by
Ghana's
new
Government
in 2017

Establish at
least One
Factory in
each of
District of
Ghana

216 Total
Districts

Establish a
minimum of
216
factories
over the
next 4 years



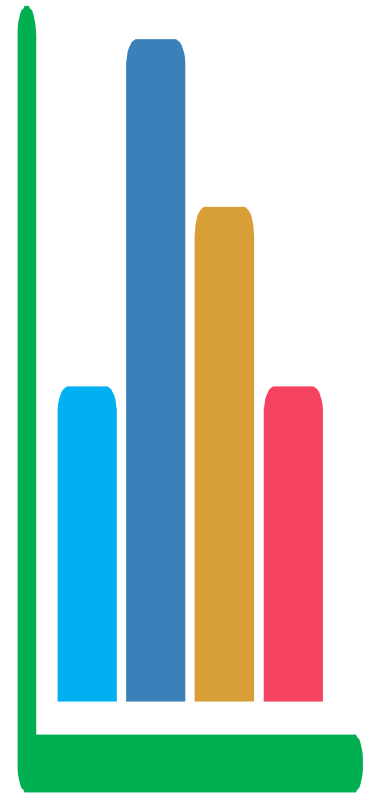
One District One Factory (1D1F)

Create jobs for the Youth in each District

Add value to Natural Resources in each District

Ensure even and spatial spread of industries across Ghana to stimulate economic activity and growth

Promote exports and increase foreign exchange earnings

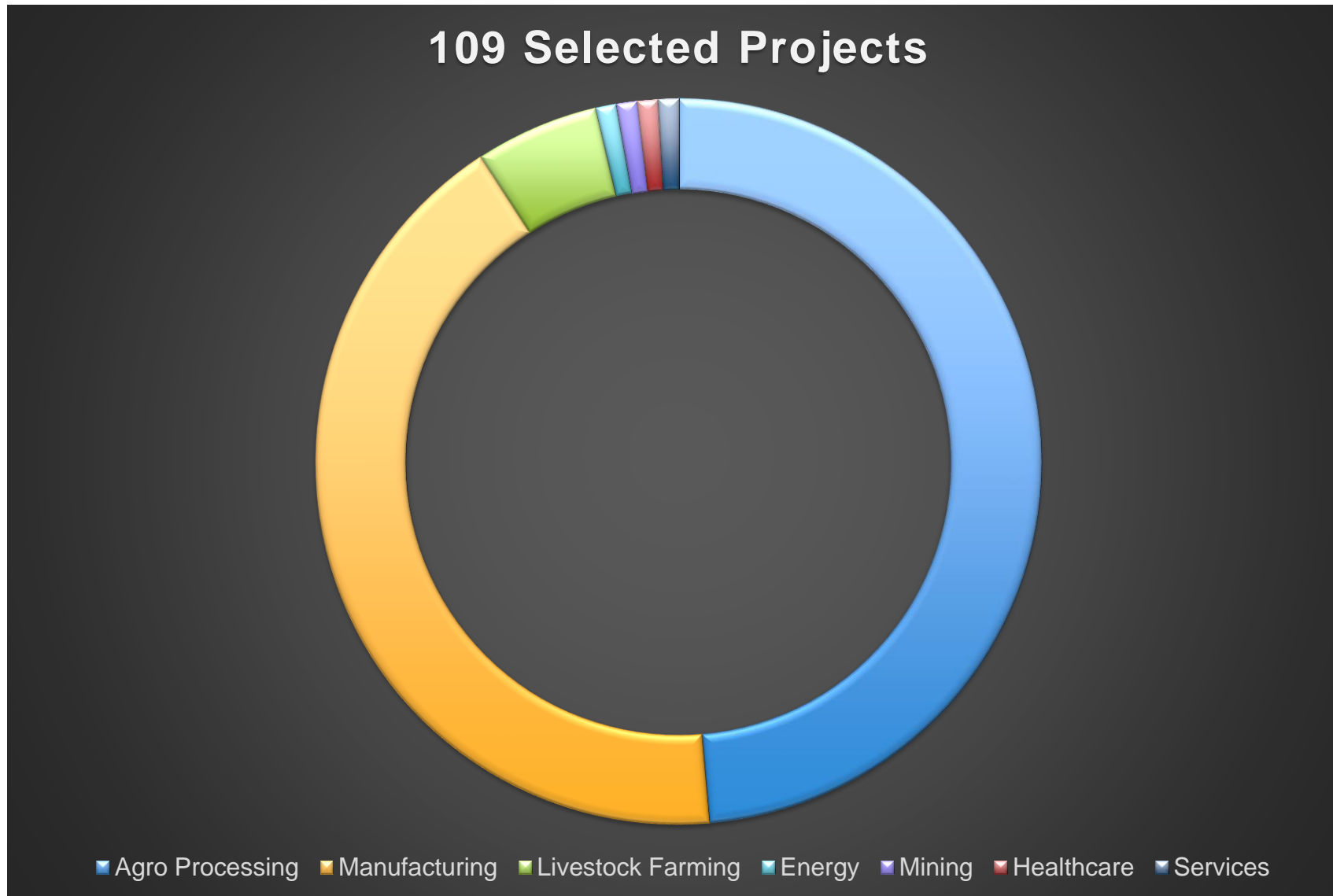


1D1F Mode of Implementation



- Identification and profiling of the natural resource endowment(s) of each District by Government (MOTI)
- Submission of Expression of Interest by Private Sector Companies
- Preparation & submission of Business Plan by the submitting Private Sector Company to MOTI
- MOTI consults with MMDAs for validation and formal adoption of the projects
- Two or more districts may collaborate to establish one district enterprise based on specific circumstances
- District enterprise to be established as a private limited liability company or as a PPP of ratio 7:3
- Where no private promoter, government will establish and divest later

1D1F Selected Projects



Selected 1D1F Company



CTK Connects with KAIST GCC



CTK - GeoSys Ltd.
AERIAL SURVEYS – MAPPING – GIS – GEOGRAPHIC ENGINEERING

April 21, 2017

Dr. Mun-Kee Choi
Director
Global Commercialization Center (GCC)
Korea Advanced Institute of Science and Technology (KAIST)

Dear Dr. Choi,

Letter of Intention (LOI) CTK-KAIST.

On behalf of the CTK Group, I would like to officially express our interest to collaborate with Global Commercialization Center (GCC) and become the local representatives of GCC in Ghana, towards providing Korean equipment, technology and technical expertise, for the establishment of factories in pursuit of Government's One-District-One-Factory Policy.

The CTK Group was established in 1994 and has been engaged in aviation, aerial photography and mapping, property rates collection and general technologies. CTK is interested in implementing five (5) projects under the One-District-One-Factory Policy while acting as local representatives of GCC to supply Korean equipment, technology and expertise to other businesses that would be implementing other projects under the Policy. Please find attached a list of some of proposed projects under the Policy.


Should you be interested in this collaboration, both parties can have further discussions and sign a Memorandum of Understanding (MOU) to allow the parties to begin working together on this project. Thank you.

Yours sincerely,



Capt. Tei Azu
Managing Director

Nº 7 SUNKWA STREET, P.O. BOX CT1216, ACCRA GHANA TEL +233 202 290 683 / +233 544 343 292 tei.azu@ctk.group



Korea Advanced Institute of Science & Technology

Letter of Response to LOI

To: Capt. Tei Azu
Managing Director
CTK GEOSYS Ltd.
No 7 Sunkwa Street
P.O. Box CT1216
Accra, Ghana

Regarding: Letter of Intention (LOI) CTK - KAIST

Date: May 2nd, 2017

Dear Capt. Tei Azu,


KAIST GCC acknowledges receipt of the Letter of Intention issued by CTK GEOSYS Ltd. on the 21st April 2017. KAIST GCC agrees to collaborate with CTK GEOSYS Ltd. in Ghana for the issue of establishment of factories in pursuit of Ghana Government's One-District-One-Factory Policy.

KAIST GCC is based in Korea Advanced Institute of Science and Technology (KAIST) located in Daejeon, South Korea. KAIST GCC was established to promote technology transfer and commercialization between Korea and emerging countries.

Both parties, KAIST GCC and CTK GEOSYS Ltd., will make best efforts for our cooperation to yield fruitful outcomes in the near future.

Sincerely yours,

Prof. MunKee Choi



Emeritus Director of KAIST Global Commercialization Center

GCC Administration B/D, 135 Mungji-ro, Nonsong-gu, Daejeon, Korea 30501
Tel +82 42-350-7152
Fax +82 42-350-7155



CTK/KAIST GCC Sign MOU

Memorandum of Understanding
between
CTK GEOSYS, Ghana
and
Global Commercialization Center
at Korea Advanced Institute of Science and Technology, Korea



The purpose of this Memorandum of Understanding is to set forth non-binding provisions, which aim at establishing a general framework governing the cooperative relationship between the Parties. The terms of each cooperation activity provided under this Memorandum of Understanding shall be agreed upon in separate written agreements signed by both Parties.

Whereas the representatives of CTK GEOSYS (hereinafter referred to as CTK), Global Commercialization Center (hereinafter referred to as GCC) at Korea Advanced Institute of Science and Technology agree to sign this MOU, in order to create technical cooperation, and to establish a friendly relationship. The entities listed above may collectively be referred as the "parties" to this MOU; the parties agree to make a Memorandum of Understanding on the following issues:

1. CTK and GCC agree to share mutual assistance and to promote technical cooperation;
2. Technical cooperation meaning:
 - a. Build a cooperative network between Ghana and Korea, as a regional hub of GCC, with the mission to promote global technology transfer and commercialization;
 - b. Cooperate for the establishment of factories in pursuit of Ghana Government's One-District-One-Factory Policy, as providing Korean equipment, technology and technical expertise;
 - c. Promote cooperation in identifying Ghana and Korea research agencies, industries and firms with promising technologies to promote value creation in both Ghana and Korea economies;

- d. Develop technology commercialization business models and support business activities for participating companies and agencies to implement and expand partnership opportunities in both Ghana and Korea;
 - e. Conduct conferences, forums, workshops and several other activities organized by the parties;
 - f. Other activities as further agreed to by the parties.
3. This Memorandum of Understanding shall expire after three years of the signing date. Amendment, addition to this Memorandum of Understanding, shall require the consent of the parties. Either party, however, may terminate this agreement by providing at least three months' prior written notice to the other party.

This Memorandum of Understanding is made in duplicate, and all texts are equally authentic. Each party will retain a copy of the Memorandum of Understanding, and the Memorandum of Understanding shall enter into force after the signature of the parties.

CTK GEOSYS	GCC KAIST
 (Capt. Tei Aam) Managing Director CTK GeoSys Ltd. Republic of Ghana	 (Professor YoungSun Kwon) Director, Global Commercialization Center, KAIST Republic of Korea
	
<i>All Parties accepted and agreed upon this date: May 2, 2017.</i>	

GCC Undertakes Ghana Trip



CTK & GCC Sign MOA

MEMORANDUM OF AGREEMENT

This Memorandum of Agreement is made and entered into on November 15, 2017 ("Effective Date") by and between:

CTK GEOSYS LIMITED (hereinafter referred to as CTK), an organization formed under the laws of GHANA, and with registered office at No. 7 Sunkwa Street, Kuku Hill, Osu-Accra;

[NAME OF ORGANIZATION (hereinafter referred to as Hankook MES)], an organization formed under the laws of and with registered office at [Address];

[NAME OF ORGANIZATION (hereinafter referred to as CTP)], an organization formed under the laws of [Country Name], and with registered office at [Address]; and

Global Commercialization Center (hereinafter referred to as KAIST GCC) at Korea Advanced Institute of Science and Technology, an organization formed under the laws of Korea, and with registered office at 291, Daehak-ro, Yuseong-gu, Daejeon, Korea;

The entities listed above may collectively be referred to as the parties or individually as a party in this Memorandum of Agreement (hereinafter referred to as MOA).

1. Purpose

The purpose of this MOA is to set forth non-binding provisions, which aims at establishing the terms and conditions, scope of work and responsibilities of the parties associated with their collaboration on the Meat Processing Plant under Ghana Government's "One-District-One-Factory" Project. The terms of each cooperation activity provided under this MOA shall be agreed upon in separate written agreements signed by the Parties.

6. Terms and Termination

- a. This MOA may be amended from time to time by mutual agreement of the parties in a written modification signed by both parties.
- b. This MOA may be terminated by mutual agreement of the parties, and shall automatically terminate upon completion of all responsibilities as stated herein, unless otherwise amended
- c. Developing either party may terminate this MOA for any reason on three (3) months written notice to the other Party.

This MOA shall be executed in English in duplicate original copies, and each Party shall receive one (1) original copy, all of which shall be equally valid and enforceable. This MOA shall become effective (the "Effective Date") upon the date this MOA is signed by the Parties.



CTK
Managing Director, Tei Azu

LOGO

Hankook MES
Position Name, Full Name

LOGO

CTP
Position Name, Full Name



KAIST GCC
Director, MunKee Choi

All Parties accepted and agreed upon this date: November 13th, 2017



4.

Planting for Food & Jobs (P4F)

Planting For Food & Jobs (PF4)

Launched April 19, 2017

Curb the migration of youth to city Centre's in search of non-existent jobs

Curb the importation of food stuffs from neighboring countries into Ghana

P4F Components

Provision of subsidized fertilizers

Supply of improved seedlings

Provision of Extension Services

Marketing for Produce

e-Agriculture

Table 3: Government Fertilizer Subsidy Program

Fertilizer Type	Full Cost (GHC)/50kg	Government Subsidy (GH¢)/50kg	% Subsidy	Selling Price (GH¢)/50kg	Farmers %
Compound	115.00	57.50	50	57.50	50
Urea	95.00	47.50	50	47.50	50
Organic (ACARP)	30	15	50	15	50
Organic (YAYRA GLOVER)	65	32.5	50	32.5	50

Source: Ministry of Food & Agriculture, 2017

5.

Smart Village Ghana (SGV®)

Smart Village Ghana®

How should rural development be done 20-30 from now?

How should farming be done 20-30 years from now?

Smart Villages Ghana® Vision

Our vision for “Smart Villages Ghana ®” is for villages in Ghana to become modernized and self-sufficient through the deliberate fusion and implementation of agricultural and non-agricultural development schemes

Smart Villages Ghana® Vision

Typical agricultural schemes include P4F

Typical non-agricultural schemes include the implementation of:

- Good, quality healthcare facilities as part of the P4F initiative
- Good schools and places of education
- Global class financial institutions
- Good access roads etc

Smart Village Ghana® Objectives

Introduce “Smart Farming” to rural areas leveraging ICBM+AI

Minimize distress migration from rural to urban areas by bring opportunities and facilities that guarantee a decent standard of living to rural dwellings

Make Smart Village Ghana® a model for Africa’s future rural development

Provide easier, faster and cheaper access to urban & international markets for agricultural produce from the model smart villages

Smart Village Ghana ® Objectives

Produce crops with market demand such as sesame

Contribute towards social empowerment by engaging all sections of the community in the task of village development.

Create and sustain a culture of cooperative living.

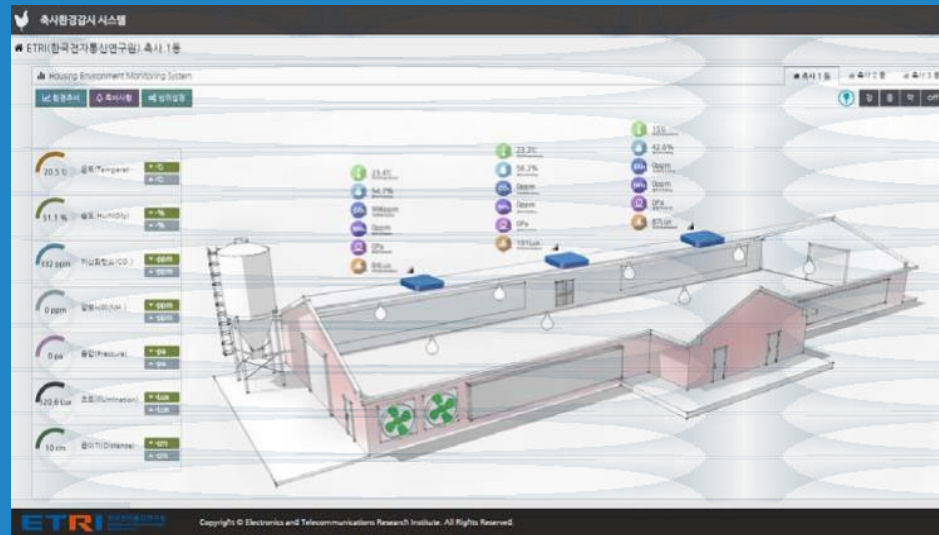


Smart Farming

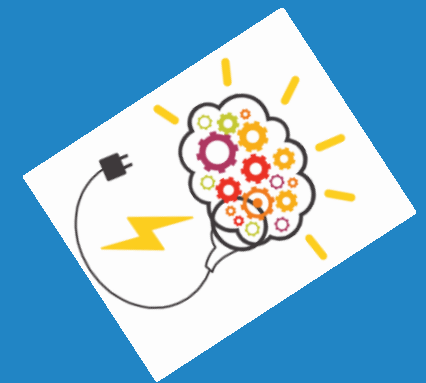
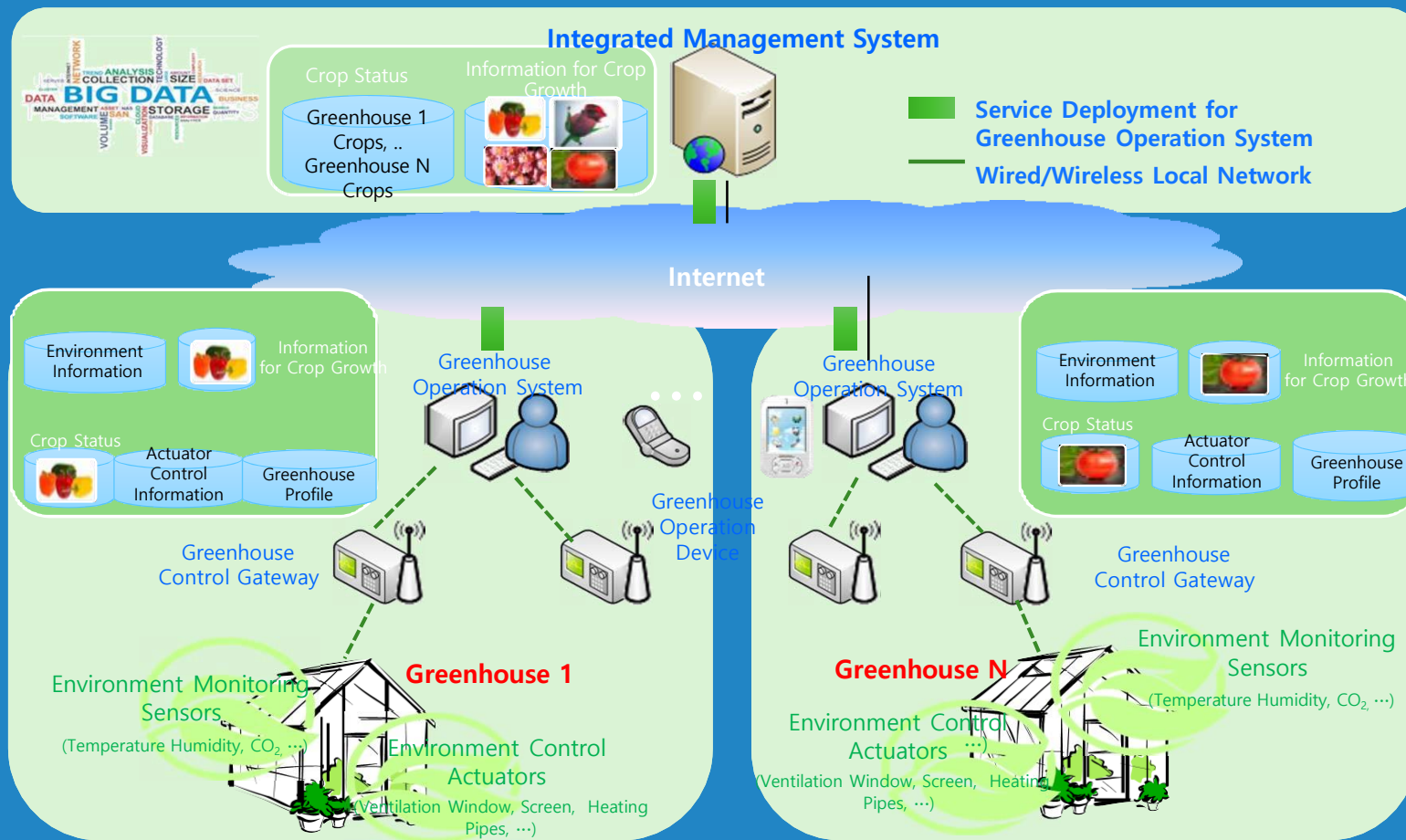
▷ Introduce “Smart Farming” to rural areas leveraging ICBM+AI

Smart Farm: Livestock house management system

- Integrated monitoring system for livestock house management using a distributed sensor network.
- Installation of monitoring sensor for environment (temperature, humidity, ammonia, carbon dioxide, and roughness)
- Operation of housing facilities with the given conditions (lighting, ventilation fans, scrapers, etc.), and maintaining the prime conditions for breeding.
- Controlled by integrated monitoring and smart devices

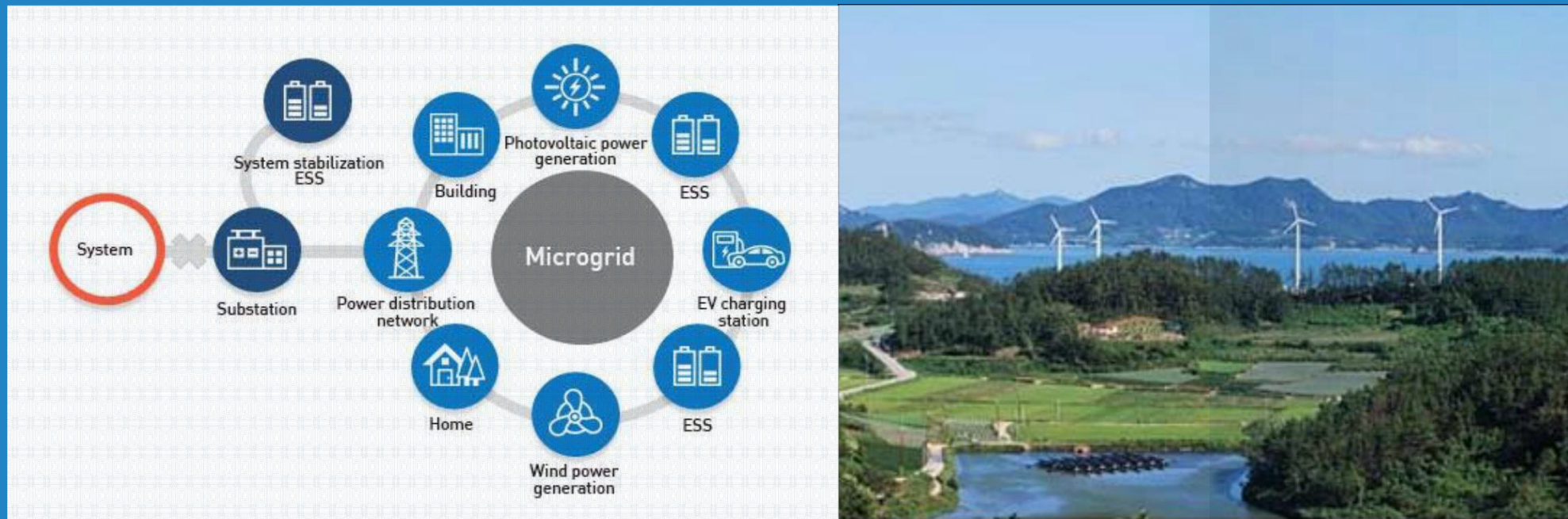


Environment Control System for Greenhouse



Microgrid

- Microgrid is a power grid that optimizes energy efficiency by exchanging the electric power information of the narrow area.
- Microgrid is applied to universities, power plants, laboratories, factories, islands such as low cost in a limited area. Use of local sources of energy to serve local loads helps reduce energy losses in transmission and distribution, further increasing efficiency of the electric delivery system



Renewable Power Generation: Photovoltaic case



Photovoltaic power generation



Wind power generation



Biomass



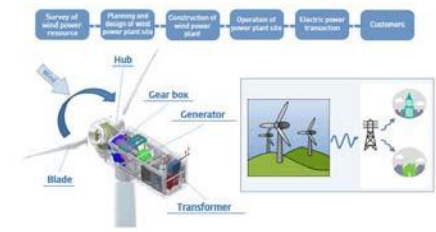
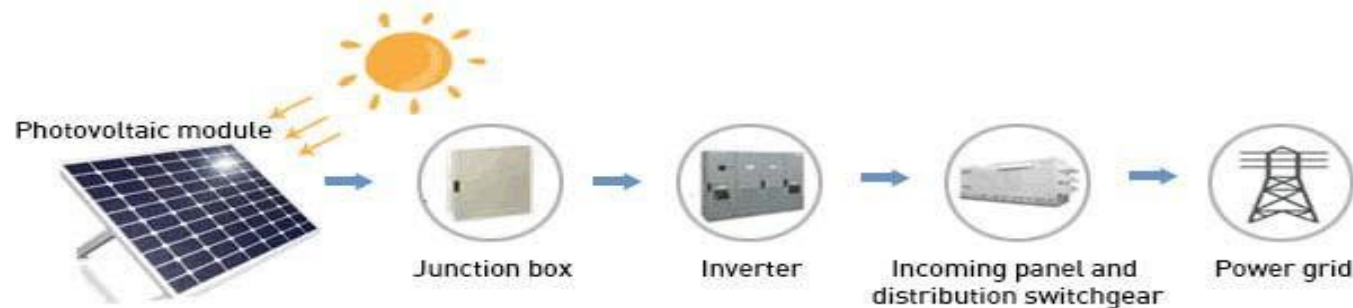
Ground surface



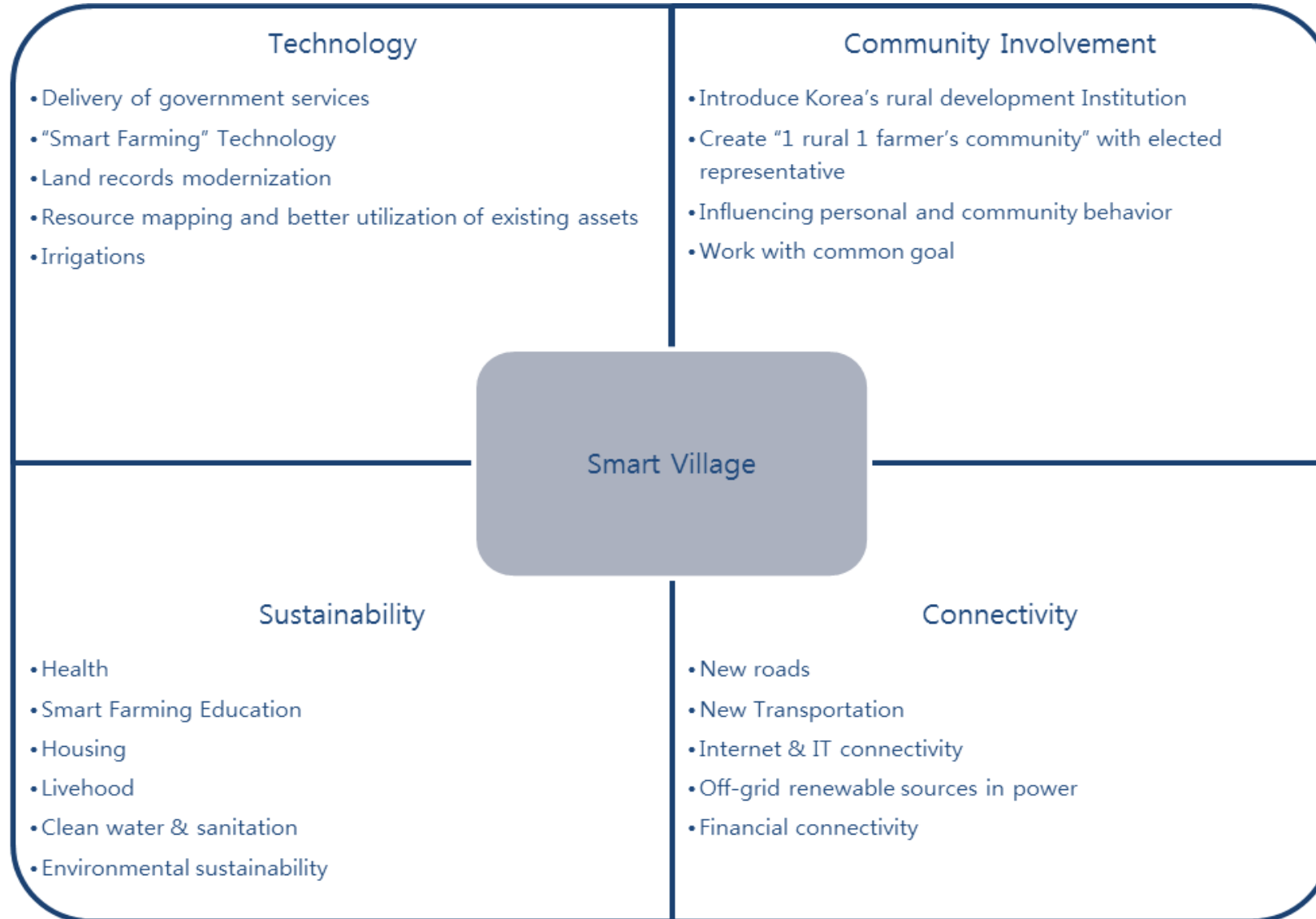
Top of buildings



Water surface



Smart Village Ghana® Key Elements



Smart Village Ghana® Strategic Partners

Government/Public Agencies

- ▷ MOFA, Korea
- ▷ MOFA, Ghana
- ▷ Ghana Embassy
- ▷ Ministry of Local Government, Ghana
- ▷ SRDA, Seoul Rural Development Administration

Private

- ▷ Royal Standard
- ▷ Cedar Seal Co. Ltd
- ▷ Other local institutions

Research Institutes/Technology Partners

- ▷ KAIST GCC
- ▷ KSUC, Korea Saemaul Undong Center
- ▷ Korean building material & construction companies

Smart Village Ghana® Critical Success Factors



Conclusion

Ghana is ready for an accelerated economic & industrial development

We are open to the right partnerships and concepts to make to make this development a reality



To our outstanding success!!

나가자!!

Acknowledgments

- ▷ Mr. Sooman Park, CEO, Royal Standard Co. Ltd.
- ▷ Dr. Young Dok Park, General Manager, KAIST GCC