Annex5 Evaluation Grid : Enhancing Resilience to Climate and Ecosystem Changes in Semi-Arid Africa: An Integrated Approach

I. Achievements of the Project

Evaluation Item		Indicator / Evaluation Questions	Source of Information
Main Category	**Sub Category**		
1. Inputs	Are the inputs from Japanese side (Experts, Equipment, Training and Budget) implemented as planned?	1) Japanese Experts Long term expert and Short term expert	· Input of the Project · List of Expert
		2) Counterparts training Training of counterpart personnel in Japan and other countries	· Input of the Project · List of trainee (Training report)
		3) Equipment	· Input of the Project · List of Equipment
		4) Local cost of project activities	· Input of the Project
	Are the inputs from Ghanaian side (CP, Office space / facility, Budget) implemented as planned?	1) Allocation of counterpart personnel	· Input of the Project · List of Counterpart
		2) Provision of the project office and facilities necessary for the project implementation.	· Input of the Project · Direct observation
		3) Other cost	· Input of the Project · Budget plan of Ghanaian side
2. Achievement of Outputs	**Output 1** Forecasting methods for climate and ecosystem change are developed and the impacts on agro-ecosystem use are assessed	1.1. Journal articles on climate and ecosystem change will be published	· Project progress reports · Annual report
		1.2. Assessment of climate change impact to agro ecosystem will be utilized	
		1.3. Report on options of adaptive agricultural production management to climate change (land utilization and cropping system etc.) will be issued.	
	Output 2 Prototype of water resources management is applied through prediction and risk analysis of extreme weather events using satellite remote sensing and ground-based observation network.	2.1. Report on flood risk assessment and extreme weather risk assessment will be issued.	· Project progress reports · Annual report
		2.2. Report on prototypes of water resource management methods will be issued.	
		2.3. Journal articles on extreme weather risk or water resource management will be published	
	Output 3	3.1. Journal articles on regional disaster governance in Northern Ghana will be published	· Project progress reports

Evaluation Item		Indicator / Evaluation Questions	Source of Information
Main Category	Sub Category		
	Institutional and engineering capacity development programs for local communities and engineers are developed and implemented	3.2. Repost on business models against for climate and ecosystem changes will be issued	· Annual report
		3.3. The capacity development program on resilience for climate and ecosystem changes will be developed	
		3.4. Training course for local engineering, governors and community will be implemented at the project site and the monitoring report will be issued.	
		3.5. Guidelines for establishing an Integrated Approach to Enhancing Resilience to Climate and Ecosystem Changes will be presented.	
3. Achievement of Project Purpose	<u>Project Purpose</u> An Integrated Approach to Enhancing Resilience to Climate and Ecosystem Changes in Northern Ghana will be developed as the 'Ghana Model', enabling target groups to overcome the vulnerability of natural resource management.	a) Educational policy and curriculum development at university level, which focus on climate and ecosystem changes	· Project progress report · Annual report · Educational policy of Ghana · Policy paper
		b) Educational policy for engineers and observation capacity development for the Ghana Meteorological Agency	
		c) Contribution to the ongoing policy formulation for climate adaptive capacity development by the Ghana Government	
4. Prospective on Achievement of the Overall Goal	<u>Overall Goal</u> The Integrated Approach to Enhancing Resilience to Climate and Ecosystem Changes will be incorporated in international environmental policies	a) Policy recommendations shared in the science and technology community (e.g. OECD/GSF) and presented to international panels and conventions such as UNFCC, CBD, UNCSD, as well as platforms like IPCC, IPBES, and CBD Secretariat.	

II. Process of the Project Implementation

Evaluation Item		Evaluation Questions	Source of Information
Main Category	Sub Category		
1.Implementation of planned activities	Activities of output 1	1-1. Build meteorological data base (time series and spatial) 1-2. Build land utilization and soil distribution data base (time series and spatial) 1-3. Build agricultural production and management data base (time series and spatial) 1-4. Integrate above three data bases by GIS	· Project document · Interview with Ghanaian and Japanese researchers

Evaluation Item		Evaluation Questions	Source of Information
Main Category	Sub Category		
		1-5. Build regional climate change prediction model and use the model to predict (solution constraint factors for downscaling of climate change prediction model) 1-6. Assess climate change impact to agro-ecosystem utilization 1-7. Assess land utilization, soil distribution and climate change by GIS 1-8. Develop agro-ecosystem valuation map based on 1-7 1-9. Develop alternative approaches on adaptive agricultural production management to climate change 1-10. Establish the institutional design of collaboration across Theme1 to 3	
	Activities of output 2	2-1. Survey the satellite and ground based observation network and construct the database 2-2. Make an early warning system, hazard map of flood and scenario of drought database 2-3. Quantitatively analyze the risks of disasters due to extreme weather for Volta river basin in Northern Ghana 2-4. Propose a prototype scheme of on-site water resources management by using outcomes from 2-3	· Project document · Interview with Ghanaian and Japanese researchers
	Activities of output 3	3-1. Select the project sites in collaboration with Theme1 and 2 3-2. Interview key actors and observe authority at different levels of governance institutions in the region 3-3. Survey farm household to understand socioeconomic activities 3-4. Outline specific crop value chains and potential business models 3-5. Based on analyses of findings derived from 3-2 to 3-4, develop institutional capacity development program 3-6. Based on analyses of findings derived from 2-4 and 3-3, develop engineering models/solutions for natural resource management capacity development program 3-7. Establish an integrated approach to enhancing resilience based on 3-5 and 3-6	· Project document · Interview with Ghanaian and Japanese researchers
2.Technical transfer	Method of technical transfer	- Are there any problems in technical transfer?	· Project document · Interview with Ghanaian and Japanese researchers
3.Change of activities	Addition and deletion of activities	- Validity of activity change	· Project document · Interview with Ghanaian and Japanese researchers

Evaluation Item		Evaluation Questions	Source of Information
Main Category	Sub Category		
4.Relationship with stakeholders	Relationship among the Project team, between project team and stakeholder	- Have regular meeting and/or JCC held at regular interval and worked for issue resolution? - Have the Project team and counterpart sufficiently communicated with each other to share information? - Have the system for chain command and division of roles been established?	· Records of Meeting and JCC · Interview with Ghanaian and Japanese researchers
5. Ownership	Ownership of CP organizations	- Have the counterparts actively participated to the Project activities? - Has the Ghanaian Government allocated sufficient budget for the Project activities?	· Project document · Interview with Ghanaian and Japanese researchers · Budget plan of Ghanaian Side
6. Monitoring and evaluation	Result of monitoring and evaluation, achievement of the Project	- Are there monitoring and feedback system?	· Project document · Interview with Ghanaian and Japanese researchers
7.Relashonship with other donors	Relationship between other donors	- Are there any collaboration with other donors?	· Project Documents · Interview with Ghanaian and Japanese researchers
8. Inhibiting and constraining factors	Factors affecting the Implementation Process	- Are there any factor affecting the implementation of the Project? (Implementation structure, policy, social environment, etc.)	· Project document · Interview with Ghanaian and Japanese researchers

III. Five evaluation criteria

Evaluation Items		Evaluation Items	Evaluation Questions	Source of Information
	Category			
Relevance	1. Priorities in relevant national policies of Ghana	Consistency with climate change adaptation policies and action plans of Ghana	- Consistency with following policies and plans - Ghanaian Biodiversity Strategy and Action Plan - Long term National Development Plan	· Interview with Ghanaian and Japanese researchers · Policy document of Ghana
	2.Nesseity	Needs of target area and beneficiaries	- Needs of counterparts and beneficiaries.	· Interview with Ghanaian and Japanese researchers

Evaluation Items		Evaluation Items	Evaluation Questions	Source of Information
	3. Relevance of the project plan	Relevance of the project plan	- Is the project plan appropriate?	· Project Documents · Interview with Ghanaian and Japanese researchers
		Factor that inhibit the relevance (if any)	- Are there any factor that inhibit the relevance of the project plan?	· Project Documents · Interview with Ghanaian and Japanese researchers
	4. Appropriateness of the project approaches	Appropriateness of selection of research subjects	- Is the selection of research subjects appropriate?	· Project Documents · Interview with Ghanaian and Japanese researchers
		Appropriateness of selection of CPs	- Is the number and capacity of CP appropriate? - Do they have adequate experiences and capacity for the Project activities?	· Project Documents · Interview with Ghanaian and Japanese researchers
		Appropriateness of selection of beneficiaries	- Is the selection of beneficiaries and pilot sites appropriate?	· Interview with Ghanaian and Japanese researchers · List of Counterpart
		Superiority of Japanese technology	- Example that use of superiority Japanese technology.	· Interview with Japanese researchers
	5. Conformity to ODA policies of the Japanese government	Consistency with the priorities in Japanese ODA	- Japanese ODA policy for Ghana and Country Assistance Program for the Republic of Ghana	· Japanese ODA policy for Ghana (2012) · Country Assistance Program for the Republic of Ghana
Effectiveness	1. Achievement of the Project purpose	Achievement of the Project purpose	- Probability of achievement of the project purpose when referring to a status of the objectively verifiable indicators	· Project Documents · Interview with Ghanaian and Japanese researchers
			- Constraints to hinder achievement of the project purpose, if any	· Project Documents · Interview with Ghanaian and Japanese researchers
	2. Causal relation "from outputs to project purpose"	Contribution of outputs for achieving the project purpose	- Contribution of outputs on the basis of achievement of the verifiable indicators for achieving the project purpose	· Project Documents · Interview with Ghanaian and Japanese researchers
		External conditions to affect achievement of the project purpose	- Is external condition satisfied?	· Interview with Ghanaian and Japanese researchers
			- Other external conditions	· Interview with Ghanaian and Japanese researchers

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Evaluation Items		Evaluation Items	Evaluation Questions	Source of Information
Efficiency	1. Progress of the inputs	Situation of the progress of the inputs	- Japanese side: Dispatch of the experts, Provision of equipment, Training in Japan, Local cost	· Input of the Project · Records of dispatch of Japanese Expert
			- Ghanaian side: Allocation of CP, Project cost	· Input of the Project
		Appropriateness of the inputs	- Appropriateness of the field of the experts, Satisfaction level of participants of the trainings, utilization of result of the Project	· Input of the Project · Training Report
	2. Achievement of the output	Achievement of the output	- Situation of achievement of the output	· Reports of the Project, Self-Evaluation Sheet · Interview with Ghanaian and Japanese researchers
	3. Causal relationship between the inputs and the outputs of the activates	Appropriateness of Inputs for achieving outputs	- The excess and deficiency in resources of the Project such as human resources.	· Input of the Project · Interview with Ghanaian and Japanese researchers
		Do the situations in outside of the Project have any effects?	- Are the external conditions?	· Interview with Ghanaian and Japanese researchers
	4. Coordination with other projects	Collaboration with other JICA project and other cooperation project.	- Cooperation and synergy effects with other JICA project	· Interview with Japanese researchers
			- Cooperation and synergy effects with projects implemented by other donors	· Interview with Japanese researchers
Impact	1. Probability of achievement of the overall goal	Probability of achievement of the overall goal	- Prospect of achievement of the overall goal	· Reports of the Project
		Factors that may promote or hinder generation of the overall goal	- Is there high possibility that the external conditions are satisfied?	· Interview with Ghanaian and Japanese researchers
		Constraining factor for achievement of Overall goal	- Factors inhibit or promote the achievement of overall goal	· Project Documents · Interview with Ghanaian and Japanese researchers
	2. Casual relationship	Relationship between overall goal and project purpose	- Isn't there significant gap between the Overall Goal and the Project purpose? Does the achievement of the Project purpose contribute the achievement of the Overall Goal?	· Project Documents · Interview with Ghanaian and Japanese researchers

Evaluation Items		Evaluation Items	Evaluation Questions	Source of Information
	Category			
	3. Spillover effects: positive	Positive impact	- Are there any positive impacts of the Project?	· Project Documents · Interview with Ghanaian and Japanese researchers
	4. Spillover effects: negative	Negative impact	- Are there any negative impacts of the Project?	· Project Documents · Interview with Ghanaian and Japanese researchers
Sustainability	1. Political aspect	Policies in the post project stage	- Possibility of continuation of political assistance in post project stage.	· Project Documents · Interview with Ghanaian and Japanese researchers
	2. Institutional aspect	Institutional capacity of CPs continue the activities in the post project stage	- Structure to continue the activities by Ghanaian side in post project stage.	· Project Documents · Interview with Ghanaian and Japanese researchers
	3. Financial aspect	Cost estimation for undertaking the necessary activities that should be continued in the post project stage	- Possibility of continuation of budget allocation for the activities in post project stage.	· Project Documents · Interview with Ghanaian and Japanese researchers
	4. Technical aspect	Technical capacity of the CP staff to undertake necessary tasks that should be continued in the post project stage	- Situation of utilization of techniques and result of the Project.	· Project Documents · Interview with Ghanaian and Japanese researchers

Japanese Fiscal Year 2012 (H.24)

No.	Name	Affiliation	Expertise	Duration From (YYMMDD)	Duration To (YYMMDD)	Days	M/M
1	Kazuhiko Takeuchi	Univ. of Tokyo/UNU	Chief Adviser	20120501	20120504	4	0.13
				20121016	20121019	4	0.13
2	Kwabena Effah Antwi	Univ. of Tokyo/UNU-IA	GIS Analysis	20120429	20120508	10	0.33
				20120818	20120908	21	0.70
				20121006	20121024	19	0.63
				20130216	20130323	38	1.27
3	Hirohiko Ishikawa	Univ. of Kyoto -DPRI	Meteorology	20120430	20120509	10	0.33
				20121015	20121021	7	0.23
				20130316	20130324	9	0.30
4	Kenichiro Kobayashi	Univ. of Kobe	Flood Management	20130316	20130324	9	0.30
5	Muneta Yokomatsu	Univ. of Kyoto -DPRI	Disaster Risk Management	20121010	20121019	10	0.33
6	Ma Weiqiang	Univ. of Kyoto -DPRI	Hydrology	20130316	20130324	9	0.30
7	Osamu Saito	UNU-IAS	Resilience Strategy	20120430	20120508	9	0.30
				20120827	20120906	10	0.33
				20121013	20121020	8	0.27
				20130224	20130303	10	0.33
8	Kei Otsuki	UNU-IAS	Governance	20120827	20120911	15	0.50
				20130217	20130222	6	0.20
9	Osamu Ito	UNU-IAS	Agronomy	20121028	20121110	13	0.43
				20130201	20130216	16	0.53
10	Yaw Agyman Boafo	UNU-IAS	Resilience Evaluation	20130216	20130317	32	1.07
			Total				8.97

Japanese Fiscal Year 2013 (H.25)

No.	Name	Affiliation	Expertise	Duration From (YYMMDD)	Duration To (YYMMDD)	Days	M/M
1	Kazuhiko Takeuchi	Univ. of Tokyo/UNU	Chief Adviser	20130804	20130809	6	0.20
2	Kwabena Effah Antwi	Univ. of Tokyo/UNU-IA	GIS Analysis	20130423	20130521	29	0.97
				20130731	20130828	28	0.93
				20140217	20140316	30	1.00
3	Geetha Mohan	Univ. of Tokyo	Agronomy	20130804	20130816	13	0.43
				20140314	20140327	14	0.47
4	Hirohiko Ishikawa	Univ. of Kyoto -DPRI	Meteorology	20130615	20130622	8	0.27
				20130801	20130807	7	0.23
				20140304	20140311	8	0.27
5	Kenichiro Kobayashi	Univ. of Kobe	Flood Management	20130803	20130809	7	0.23
6	Muneta Yokomatsu	Univ. of Kyoto -DPRI	Disaster Risk Management	20130611	20130623	13	0.43
				20131107	20131124	18	0.60
7	Subhajyoti Samaddar	Univ. of Kyoto -DPRI	Disaster Risk Management	20130611	20130623	13	0.43
				20130803	20130810	8	0.27
				20131107	20131124	18	0.60
				20140303	20140315	13	0.43
8	Srikantha Herath	UNU-IAS	Disaster Risk Management	20140306	20140314	9	0.30
9	Osamu Saito	UNU-IAS	Resilience Strategy	20130803	20130815	13	0.43
				20140304	20140313	10	0.33
10	Kenichiro Kobayashi	Univ. of Kobe	Flood Management	20131020	20131103	14	0.47
11	Ram Avtar	UNU-IAS	GIS Analysis	20140306	20140314	9	0.30
12	Yaw Agyman Boafo	UNU-IAS	Resilience Evaluation	20130731	20130828	28	0.93
				20140209	20140323	45	1.50
13	Nicholas Turner	UNU-IAS	Systematic Capacity Development	20130805	20130813	9	0.30
			Total				12.33

Japanese Fiscal Year 2014 (H.26)

No.	Name	Affiliation	Expertise	Duration From (YYMMDD)	Duration To (YYMMDD)	Days	M/M
1	Kazuhiko Takeuchi	Univ. of Tokyo/UNU	Chief Adviser	20140803	20140813	11	0.37
				20140921	20141001	11	0.37
2	Kwabena Effah Antwi	Univ. of Tokyo/UNU-IA	GIS Analysis	20140721	20140826	35	1.17
				20141205	20141215	11	0.37
				20150216	20150315	28	0.93
3	Geetha Mohan	Univ. of Tokyo	Agronomy	20140802	20140814	12	0.40
4	Alexandros Gasparatos	Univ. of Tokyo	Agronomy	20140805	20140811	7	0.23
5	Hirohiko Ishikawa	Univ. of Kyoto -DPRI	Meteorology	20140613	20140623	11	0.37
				20140801	20140813	13	0.43
				20150318	20150328	11	0.37
6	Kenichiro Kobayashi	Univ. of Kobe	Flood Management	20140801	20140813	13	0.43
7	Muneta Yokomatsu	Univ. of Kyoto -DPRI	Disaster Risk Management	20140705	20140717	13	0.43
8	Subhajyoti Samaddar	Univ. of Kyoto -DPRI	Disaster Risk Management	20140707	20140716	10	0.33
				20140804	20140817	14	0.47
				20150314	20150328	15	0.50
9	Osamu Saito	UNU-IAS	Resilience Strategy	20140802	20140813	12	0.40
				20140921	20141001	11	0.37
				20150206	20150212	7	0.23
10	Osamu Ito	UNU-IAS	Agronomy	20140707	20140719	13	0.43
				20141102	20141114	13	0.43
11	Yaw Agyman Boafo	UNU-IAS	Resilience Evaluation	20140720	20140826	37	1.23
12	Yasuko Kusakari	Univ. of Tokyo	Rural Livelihood and Local Capacity Development	20140731	20140828	29	0.97
				20150301	20150323	23	0.77
13	Sadahisa Kato	UNU-IAS	Resilience Enhancement	20140730	20140818	19	0.63
14	Otsuki Kei	UNU-IAS	Governance	20150315	20150326	12	0.40
Total							13.03

Japanese Fiscal Year 2015 (H.27)

No.	Name	Affiliation	Expertise	Duration From (YYMMDD)	Duration To (YYMMDD)	Days	M/M
1	Kazuhiko Takeuchi	Univ. of Tokyo/UNU	Chief Adviser	20150801	20150813	13	0.43
2	Kwabena Effah Antwi	Univ. of Tokyo/UNU-IA	GIS Analysis	20150710	20150814	36	1.20
				20151201	20151222	22	0.73
3	Geetha Mohan	Univ. of Tokyo	Agronomy	20150710	20150729	20	0.67
				20160322	20160331	10	0.33
4	V Jean Frants	UNU-IAS	Climate Change Impact Assesment	20150710	20150720	11	0.37
5	Hirohiko Ishikawa	Univ. of Kyoto -DPRI	Meteorology	20150729	20150813	16	0.53
				20160319	20160327	9	0.30
6	Kenichiro Kobayashi	Univ. of Kobe	Flood Management	20150829	20150906	9	0.30
7	Muneta Yokomatsu	Univ. of Kyoto -DPRI	Disaster Risk Management	20151209	20151219	11	0.37
8	Subhajyoti Samaddar	Univ. of Kyoto -DPRI	Disaster Risk Management	20150710	20150721	12	0.40
				20150801	20150813	14	0.47
				20151209	20151219	11	0.37
9	Osamu Saito	UNU-IAS	Resilience Strategy	20150408	20150411	4	0.13
				20150802	20150813	12	0.40
				20151114	20151119	6	0.20
10	Takashi Unuma	Univ. of Kyoto	Meteorological Analysis	20150704	20150721	18	0.60
				20151209	20151219	11	0.37
				20160319	20160327	9	0.30
11	Yaw Agyman Boafo	UNU-IAS	Resilience Evaluation	20151113	20151207	25	0.83
				20150717	20150831	45	1.50
12	Yasuko Kusakari	Univ. of Tokyo	Rural Livelihood and Local Capacity Development	20150726	20150811	17	0.57
				20160208	20160328	50	1.67
13	Kukuko Shoyama	UNU-IAS	Resilience Enhancement	20150802	20150813	12	0.40
Total							13.43

Grand Total	47.77

Note:

Data is as of 31 March 2016

UNU: United Nation University, UNU-IAS: United Nation University Institute for the Advanced Study of Sustainability,
DPRI: Disaster Prevention Research Institute

No.	Name	Position	Affiliation	Training Organization	Field of Training	Period from YYMMDD	Period to YYMMDD	Days
1	Samuel Owusu Ansah	Assistant Meteorologist	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto Univ. of Nagoya	The use of satellite derived precipitation data	2012/11/9	2012/12/3	25
2	Shaibu Abdul-Ganiyu	Senior Lecturer	University for Development Studies (UDS)	Univ. of Kyoto Univ. of Nagoya	The use of satellite derived precipitation data	2012/11/9	2012/12/3	25
3	Kwadwo Owusu	Lecturer	Univ. of Ghana	Univ. of Kyoto Univ. of Nagoya	The use of satellite derived precipitation data	2012/11/9	2012/12/3	25
4	Kwabena Asubonteng	Researcher	UNU-INRA	United Nations University (UNU), Univ. of Tokyo	GIS Training for joint development of GIS training program with CECARE-Africa	2013/1/25	2013/2/5	12
5	Alex Barima Owusu	Lecturer	Univ. of Ghana	United Nation Univ. Univ. of Tokyo	GIS Training for joint development of GIS training program with CECARE-Africa	2013/1/25	2013/2/5	12
6	Kwabena Asubonteng	Researcher	UNU-INRA	United Nation Univ.	GIS Training for joint development of GIS training program with CECARE-Africa	2014/1/25	2014/2/2	9
7	Victor Lolig	Researcher	University for Development Studies (UDS)	United Nation Univ.	GIS Training for joint development of GIS training program with CECARE-Africa	2014/1/25	2014/2/2	9
8	Samuel Owusu Ansah	Assistant Meteorologist	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto	Basics of Numerical weather prediction	2013/11/9	2013/12/20	42
9	Peter Nunekpeku	Assistant Meteorologist	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto	Basics of Numerical weather prediction	2013/11/9	2013/12/20	42
10	Ziem Romanus	Researcher	University for Development Studies (UDS)	United Nation Univ.	Resilience enhancement	2014/9/5	2014/10/17	43
11	Saeyram Kofi Loh	Researcher	UNU-INRA	United Nation Univ.	Resilience enhancement	2014/9/5	2014/10/17	43
12	Samuel Owusu Ansah	Assistant Meteorologist	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto	Weather prediction	2014/11/29	2015/3/15	107
13	Lolig Victor	Researcher	University for Development Studies (UDS)	United Nation Univ.	Response to climate and ecosystem change	2015/9/6	2015/10/8	33
14	Mujeeb Rahaman Adams	Researcher	University for Development Studies (UDS)	United Nation Univ.	Resilience enhancement	2015/9/6	2015/10/8	33
15	Francis A. Chimsa	Researcher	University for Development Studies (UDS)	United Nation Univ.	Resilience enhancement	2015/9/6	2015/10/8	33
16	Dina Adjei Boadi	Researcher	Univ. of Ghana	United Nation Univ.	Evaluation research method for climate and ecosystem change	2015/9/6	2015/10/8	33
17	Botchwey Isaac	Researcher	Univ. of Ghana	United Nation Univ.	Evaluation research method for climate and ecosystem change	2015/9/6	2015/10/8	33
18	Richard AGYEMAN	Researcher	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto	Evaluation research methods for prediction accuracy	2016/1/16	2016/2/12	28
19	Caleb MENSAH	Researcher	Ghana Meteoroidal Agency (G-Met)	Univ. of Kyoto	Evaluation research methods for prediction accuracy	2016/1/16	2016/2/12	28
20	Frank Teye OBLIM	Researcher	WRI	Kobe Univ.	Flood calculation	2016/2/20	2016/3/16	26
21	Fred Yaw LOGAH	Researcher	WRI	Kobe Univ.	Video flow measurement training	2016/2/20	2016/3/16	26
22	Bob Alfa	Researcher	WRC	Kobe Univ.	Flow data analysis	2016/2/20	2016/3/16	26
23	Godfred Jasaw	PhD Student	University for Development Studies (UDS)	United Nation Univ.	Integrated resilience building strategy	2013/9/1	2016/8/31	1096

Annex 8 List of the provided equipment

Japanese Fiscal Year 2012

No.	Name	Equipment	Maker	Quantity	Currency	Price	Installation Place	Current Condition
1	Clear One Chat 150 (Speaker)	CHAT150USB 910-156-200	Clear One	4	JPY	252,000	UG, G-Met, UDS, UNU-INRA	Good
2	Laptop PC	Think Pad L530 2481CTO	Lenovo	4	JPY	504,000	UG, G-Met, UDS, UNU-INRA	Good
3	Liquid crystal projector	EB-W12	EPSON	4	JPY	336,000	UG, G-Met, UDS, UNU-INRA	Good
4	Screen	ELPSC23	EPSON	4	JPY	160,000	UG, G-Met, UDS, UNU-INRA	Good
5	Digital camera	DMC-TZ30-K	Panasonic	2	JPY	72,000	PJ Office	Good
6	Color Monitor	E2341V-BNX AJLMOSN	LG	2	JPY	43,600	G-Met HQ	Good
7	Data Server(workstation) with software	RCR-X200(RCRXE5140-R32),Visual Fortram Composer XE2013, Visual Studio Pro2012	Real Computing	2	JPY	2,108,000	G-Met HQ	Good
8	Elemental Analyzer	Model:MH-5000 with Standard accessories	Micro Emission	1	JPY	3,000,000	UDS	Good
9	Carrying case	Model:Watertight case with special inner	Micro Emission	1	JPY	40,000	UDS	Good
10	Quartz Cuvette	Model:LepiCuve-C	Micro Emission	3	JPY	150,000	UDS	Good
11	Regin Cuvette	Model:LepiCuve-02	Micro Emission	1Pac	JPY	16,000	UDS	Good
12	GIS Software Licenses	Professional EMEA Educ Kit	ERADAS IMAGINE	10	USD	17,900	UNU-INRA (GIS Lab)	license renewed in 2014
	Total				JPY	8,539,083	-	-
					GHS	311,645	-	-

(Exchange rate USD 1.0 =JPY 103.77, GHS 1.0 = JPY 27.4 as of Sep 2014)

Japanese Fiscal Year 2013

No.	Name	Equipment	Maker	Quantity	Currency	Price	Installation Place	Current Condition
1	Data Server	HP Proliant DL380p 8G(470065-656)	HP	1	GHS	9,800	UG	Good
2	Desktop PC	HP Elite 8300SFF with23in.monitor	HP	1	GHS	3,530	UG	Good
3	Laptop PC	Toshiba Satellite S55-A5339	Toshiba	1	GHS	3,200	UG	Good
4	Automatic Weather Station (AWS)	MAWS301	VAISALA	3	GHS	265,000	G-Met Bole,Yendi, Salaga stations	Battery chnage (Bole, Yendi)
5	RC-C Server Xeon 4way with software	RC CS21K-SB20256,PowerChute Business Edition Delux for Linux;Unix 1node Simple Shutdown without upgrade license	Real Computing	1	JPY	2,498,370	G-Met HQ	Good
	Total				JPY	10,212,292	-	-
					GHS	372,711	-	-

(Exchange rate USD 1.0 =JPY 103.77, GHS 1.0 = JPY 27.4 as of Sep 2014)

Japanese Fiscal Year 2014

No.	Name	Equipment	Maker	Quantity	Currency	Price	Installation Place	Current Condition
9	Hydrosense	HS2P-12-C		1Set	JPY	242,100	UDS	Good
10	Hydrosense	HS2P-20-C		1	JPY	242,100	UDS	Good
11	Accu PAR Computer LP-80	N/A		1	JPY	675,400	UDS	Good
12	Mini Disk Infiltorometer Decagon Devices	N/A		1set	JPY	106,920	UDS	Good
13	Laptop PC	Panasonic Tough Book 19 CF-195W1ACS	Panasonic	1	JPY	285,500	UDS	Good
14	Rain Gauge	RG3-M		10	JPY	531,000	Field in Fihini *	Good
15	Optic USB Base Station	BASE-U-1		2set	JPY	20,000	UDS	Good
16	BHW-PRO-CD software	N/A		1	JPY	17,000	UDS	Good
17	U12 4-External Channel Outdoor Data Logger	N/A		2	JPY	70,600	UDS	Good
18	Temperature sensor	TMC20-HD		24	JPY	148,800	Field in Fihini*	Good
19	Tensiometer sensor	DIK-3160-11,DIK-3160-54,DIK-8333-11,DIK-3160-54, DIK-3160-11		2each	JPY	159,200	Field in Fihini	Good
20	Tensiometer indicator	DIK-3162-01		10	JPY	56,000	Field in Fihini	Good
21	Automatic Rain Gauge	A757 add PULSE GPRS QUAD	ADCON	10	USD	22,274,580	Field in Northern Ghana	Good
22	Automatic Weather Station	VaisalaAWS 310 with Lap Top PC	VAISALA, Dell	5	USD	20,203,660	Field in Nalerigu, Nasia,VEA,Kojoperi,Damongo	Good
	Total				JPY	45,032,860	-	-
					GHS	1,350,392	-	-

(Exchange rate GHS 1.0 = JPY 33.348as of March 2015)

Japanese Fiscal Year 2015

No.	Name	Equipment	Maker	Quantity	Currency	Price	Installation Place	Current Condition
1	Chlorophyll Meter	SPAD-502Plus	KONICA MINO	1	JPY	149,040	UDS	Good
2	Grain Moisture Tester	PM-450	KETT Electric I	1	JPY	98,000	UDS	Good
3	Outdoor capable LCD Display	FCH2155-WHA0L0	SKR	2	JPY	1,000,000	UDS	Good
4	Wirless Microphone Speaker	400-SP055	SANWA	2	JPY	88,704	UDS	Good

5	Wireless Microphone	400-SP045	SANWA	1	JPY	2,950	UDS	Good
6	Portable Power Packs	Hitachi-koki EH400D(A6)	HITACHI-Koki	2	JPY	218,400	UDS	Good
7	Portable Power Packs	CELLSTAR PD-650	Cellstar	1	JPY	35,047	UDS	Good
8	Book	Disaster Education and Management		1	JPY	20,241	UDS	Good
9	Book	Handbook of Hazard and Disaster Risk Reducation		1	JPY	10,076	UDS	Good
10	Leaf Area Index Scanner	Accupar LP-80	ACCUPAR	1	JPY	696,700	UDS	Good
11	Nitrate Metre	Horiba B-741	HORIBA	2	JPY	79,600	UDS	Good
12	Nitrate Metre	Horiba B-742	HORIBA	2	JPY	90,000	UDS	Good
13	Nitrate Metre	Horiba B-743	HORIBA	2	JPY	76,000	UDS	Good
14	Ph Meter Bench	Horiba F-74BW-M	HORIBA	1	JPY	350,000	UDS	Good
15	Ph Meter with Dissolved oxgen sensor	Horiba D-75S/9520-10D	HORIBA	2	JPY	4,206,000	UDS	Good
16	Core Sampler	HSC-20	Fujiwara	1	JPY	144,000	UDS	Good
17	Constant Temperature Dryer	OF-300S	Fujiwara	1	JPY	134,900	UDS	Good
18	Weather Station with Soil Moisture Sensor	WD2900ET/6450WD,6450WD-20,SM100 6460,SM100 6460-20	Watermark	1	JPY	484,760	UDS	Good
19	A3 Copier	HP 5225DN	HP	1	JPY	143,608	UDS	Good
20	3000VA UPS	APC SMART3000I	APC	1	JPY	130,558	UDS	Good
21	Automatic Rain Gauge with Soil Moisture Sensor	A755 add SDI V2 GPRS QUAD/SM1	ADCON	10	JPY	7,815,360		Good
22	Automatic Weather Station	VaisalaAWS 310	VAISALA	3	JPY	12,402,000	Field in Tume, Kete-Krachi, Wenchi	Good
23	Video Camera	SONY 4K Handycam FDR-X3000	SONY	1	JPY	95,428	G-Met	Good
24	Work Station with Monitor&Keyboard	RC ViKGI60/Acer 24inch	Real Computing	1	JPY	570,240	G-Met	Good
25	5000VA UPS	APC SMART 5000VA (SRT5KXLI)	APC	1	JPY	335,314	G-Met	Good
26	Handheld GPS Navigator	Garmin GPSMAP 64S	GARMIN	10	JPY	420,500	UNU-INRA	
	Total				JPY	29,797,426	-	-
					GHS	1,014,139	-	-

(Exchange rate GHS 1.0 = JPY 29.382 as of March 2015)

Japanese Fiscal Year 2016

No.	Name	Equipment	Maker	Quantity	Currency	Price	Installation Place	Current Condition
1	Video Camera	SONY 4K Handycam FDR-AXP55	SONY	1	JPY	175,900	WRI	Good
2	Total Station	SOKKIA CX-107		1	JPY	1,150,000	WRI	Good
	Total				JPY	1,325,900	-	-
					GHS	49,574	-	-

(Exchange rate GHS 1.0 = JPY 26.746 as of Aug 2016)

Grand Total	JPY	**94,907,561**
	GHS	**3,098,460**

Annex 9 List of Ghanaian Counterpart personnel

University of Ghana

No.	Name	Position	Affiliation	Project Position (RD)
1	Prof. Edwin Akonno Gyasi	Professor	Department of Geography and Resource Development	Project Director (PD), Agricultural Land Management and Participatory Rural Development
2	Prof. Daniel Sarpong	Professor	Department of Agriculture Economics	
3	Dr. Adelina Mensah	Lecturer	Department of Geography and Resource Development	
4	Dr. Alex Owusu Barima	Lecturer	Department of Geography and Resource Development	
5	Dr. Kwadwo Owusu	Lecturer	Department of Geography and Resource Development	
6	Mr. Gerald A. B. Yiran	Assistant Lecturer	Department of Geography and Resource Development	
7	Prof. Mark Kofi Abekoe	Supervisor, Associate Professor	Department of Soil Science	
8	Mr. George Owusu	Assistant Lecturer	Hydrology, Department of Geography and Resource Development	
9	Dr. Oteng Ababio	Senior Lecturer	Department of Geography and Resource Development	
10	Dr. Kwabena Awere Gyekye	Lecturer	Department of Geography and Resource Development	Landscape Ecology
11	Dr. Emmanuel Morgan Attua	Senior Lecturer	Department of Geography and Resource Development	
12	Mr. Emmanuel Tachie-Obeng	Special Lecturer	Department of Geography and Resource Development	
13	Mr, Issac Botchey	Researcher	Department of Geography and Resource Development	
14	Ms.Dina Adjei Boadi	Researcher	Department of Geography and Resource Development	
15	Mr.Mark Fyng	Researcher	Department of Geography and Resource Development	
16	Mr.Stephen Frempong	Researcher	Department of Geography and Resource Development	
17	Mr.Richimond Ametefe	Researcher	Department of Geography and Resource Development	
18	Mr. Sosthenes Kwadzo Kufubge	Researcher	Department of Geography and Resource Development	
19	Prof. Paul William Kwadjo Yankson	Professor	Department of Geography and Resource Development	
20	Mr.Rafiatu Abubakari	Researcher	Department of Geography and Resource Development	

Ghana Meteorological Agency

No.	Name	Position	Affiliation	Project Position (RD)
1	Gp. Capt. Stephen Y. Komla	Director General	Ghana Meteorological Agency	
2	Mr. Ayilari-Naa Juati	Chief Researcher	Ghana Meteorological Agency	Weather Observation and Forecasting
3	Mr. Charles Yorke	Researcher	Ghana Meteorological Agency	
4	Mr. Dominic Pokperlaar	Researcher	Ghana Meteorological Agency	
5	Mrs. Francisca Martey	Researcher	Ghana Meteorological Agency	
6	Mr. Andrew Nkansah	Researcher	Ghana Meteorological Agency	
7	Mr. Amos Narh	Researcher	Ghana Meteorological Agency	
8	Mr. Zinedeme Minia	Researcher	Ghana Meteorological Agency	

University for Development Studies

No.	Name	Position	Affiliation	Project Position (RD)
1	Prof. Gordana Kranjac-Berisavljevic	Professor	University of Development Studies,	
2	Dr. Francis Kwabena Obeng	Senior Lecturer	Faculty of Agribusiness and Communication Sciences (Nyankpala)	Extension and Training
3	Mr. Shaibu Abdul-Ganyu	Senior Lecturer	Faculty of Agriculture (Nyankpala)	Hydrology
4	Dr.Togbiga Dzivenu	Executive Director	Center for Disaster Research and Education (Wa)	
5	Mr. Balma Yakubu	Lecturer	Faculty of agriculture busines	
6	Mr. Frederick Dayuo	Lecturer	Department of Community Development (Wa)	
7	Dr. Godfred Jasaw	Lecturer/Researcher	Department of Community Development (Wa)	
8	Dr. Samuel A. Donkoh	Senior Lecturer	Faculty of Agribusiness and Communication Sciences (Nyankpala)	Economics
9	Mr. Victor Lolig	Lecturer	Faculty of Agribusiness and Communication Sciences (Nyankpala)	
10	Dr. Richard Yeboah	Senior Lecturer	Faculty of Agribusiness and Communication Sciences (Nyankpala)	Agribusiness
11	Mr. Felix K. Abagale	Senior Lecturer	Faculty of Agriculture (Nyankpala)	
12	Mr. Vincent Kodjo Avornyo	Lecturer	Department of Agronomy, Faculty of Agriculture (Nyankpala)	
13	Dr. Jonas Akurigu	Researcher	Department of Agronomy, Faculty of Agriculture (Nyankpala)	
14	Mr.Francis Chimsah	Researcher	Department of Agronomy, Faculty of Agriculture (Nyankpala)	
15	Mr.Halim Abubakar	Researcher	Department of Agronomy, Faculty of Agriculture (Nyankpala)	
16	Mr.Effiam Oku	Researcher	Department of Agronomy, Faculty of Agriculture (Nyankpala)	

Institute for Natural Resources in Africa, United Nation University

No.	Name	Position	Affiliation	Project Position (RD)
1	Dr. Elias T. Ayuk	Director	UNU-INRA	Agricultural Economist
2	Mr. Kwabena Owusu Asubonteng	Geo-Information Analyst	UNU-INRA	
3	Ms. Yasuko Kusakari	Socio-Economist Fellow	UNU-INRA	Rural Livelihoods and Local Capacity Development
4	Dr. Timothy Koomson	Environmental Policy Fellow	UNU-INRA	Environment
5	Dr. Gessesse Dessie	Capacity development fellow	UNU-INRA	

Water Research Institute

No.	Name	Position	Affiliation	Project Position (RD)
1	Dr.Kankam-Yeboah	Chief Research Scientist	WRC	
2	Mr.Frank Teye Oblim	Researcher	WRC	
3	Mr.Fred Yaw Logah	Researcher	WRC	

Water Resources Commission

No.	Name	Position	Affiliation	Project Position (RD)
1	Dr.Bob Alfa	Researcher	WRI	

Annex 10 List of the published original papers

Output 1

1) Ramu, K., Watanabe, T., Uchino, H., Sahrawat, K. L. Wani, S. P., Ito, O.: Fertilizer induced nitrous oxide emissions from Vertisols and Alfisols during sweet sorghum cultivation in the Indian semi-arid tropics, Science of the Total Environment, 438. pp. 9-14, 2012.
2) Mohan, G. and Matsuda, H.: Regional level total factor productivity growth in Ghana agriculture, Journal of Economics and Sustainable Development, Vol. 4, No.5, pp. 195-206, 2013.
3) Uchino, H., Watanabe, T., Ramu, K., Sahrawat, K. L., Marimuthu, S., Wani, S. P., Ito, O.: Effects of Nitrogen Application on Sweet Sorghum (Sorghum bicolor (L.) Moench) in the Semi-Arid Tropical Zone of India. JARQ - Japan Agricultural Research Quarterly, Vol. 47, No. 1, pp. 65-73, 2013.
4) Mohan, G., and Matsuda, H.: Regional level total factor productivity growth in Ghana agriculture, Journal of Economics and Sustainable Development, Vol. 4, No.5, pp. 195-206, 2013. http://www.iiste.org/Journals/index.php/JEDS/article/view/5017/5116
5) Mohan, G., Matsuda, H., Donkoh, S. A., Lolig, D. V., and Abbeam, G. D.: Effects of Research and Development Expenditure and Climate Variability on Agricultural Productivity Growth in Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 443-451, 2014.
6) Tachie-Obeng, E., Hewitson, B., Gyasi, E. A., Abekoe, M. K., and Owusu,G.: Downscaled Climate Change Projections for Wa District in the Savanna Zone of Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 422-431, 2014.
7) Antwi, E.K., Boakye-Danquah, J., Asabere, B.S., Takeuchi, K., and Wiegleb. G. Land Cover Transformation in Two Post-Mining Landscapes Subjected to Different Ages of Reclamation since Dumping of Spoils, SpringerPlus, 2014, Vol 3, (1), 702.
8) Antwi, E.K., Boakye-Danquah, J., Owusu, A.B., Boafo, Y. A., Mensah, R., Apronti, T.P. Community Vulnerability Assessment Index for Flood Prone Savannah Aro-Ecological Zone: A Case Study of Wa West District, Ghana. Weather and Climate Extremes, 2015, Vol 10 (2) 56–69.
9) Inatsu, M., Nakayama, T., Maeda, Y., and Matsuda, H.: Dynamical Downscaling for Assessment of the Climate in Ghana. Journal of Disaster Research, Journal of Disaster Research, 2014, Vol. 9 No. 4, pp. 412-421
10) Mensah, R., Antwi, E.K., Attua, E.M., Chimsah, F.A., Boakye-Danquah, J., Sackey. I. Biodiversity of Woody Species and their Utilization in a Savannah Ecological zone of Northern Ghana. Journal of Biodiversity and Environmental Sciences, 2016, Vol 8 (3), 22-45.

Output 2

1) Kobayashi, K. and Takara, K.: Development of a Distributed Rainfall-Runoff/Flood Inundation Simulation and Economic Risk Assessment Model, Journal of Flood Risk Management, DOI:10.1111/j.1753-318X.2012.01157, 2012.
2) Sawai, N., Takara, K., and Kobayashi, K.: Evaluation of water retention capacity and flood control function of the forest catchment, Journal on Food, Agriculture and Society, Vol. 1, No. 1 , pp. 13-22, 2013.
3) Kobayashi, K., and Takara, K.: Development of a Distributed Rainfall-Runoff/Flood Inundation Simulation and Economic Risk Assessment Model, Journal of Flood Risk Management, Vol. 6, Issue 2, pp. 85-98, 2013.
4) Samaddar, S., Yokomatsu, M., Dzivenu, T., Oteng-Abadio, M., Adams, M.R., Dayour, F., and Ishikawa, H.: Assessing Rural Communities Concerns for Improved Climate Change Adaptation Strategies in Northern Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 529-541, 2014.
5) Sawai, N., Kobayahsi, K., Apip, Takara, K., Ishikawa, H., Yokomatsu, M., Samaddar, S., Juati, A.-N., and Kranjac-Berisavljevic, G.: Impact of Climate Change on River Flows in the Black Volta River, Journal of Disaster Research, Journal of Disaster Research, Vol. 9 No. 4, pp. 432-442, 2014.
6) Subhajyoti Samaddar, F. K. Obeng, Z. Romanus, Muneta Yokomatsu and Hirohiko Ishikawa : What constitutes an effective community participation in disaster risk management? Voices from the fields of Ghana, The 6th Conference of the International Society for Integrated Disaster Risk Management (TIFAC – IDRiM Conference) on "Disaster Risk Reduction: Challenges and Opportunities for Sustainable Growth" New Delhi, India, October

28-30, 2015.

7) Subhajyoti Samaddar, Muneta Yokomatsu, Togbiga Dzivenu, Martin Oteng-Ababio, Mujeeb Rahaman Adams, Frederick Dayour and Hirohiko Ishikawa (2015). Evaluating effective public participation in disaster management and climate change adaptation: insights from northern Ghana through a user-based approach. Risk, Hazards & Crisis in Public Policy , 6 (1), pp. 117 -143.
8) Shaibu Abdul-Ganiyu, Benjamin Osei-Mensah, Thomas A. Apusiga, Hirohiko Ishikawa, Gordana Kranjac-Berisavljevic, 2015: Effects of Different Planting Distance on Soil moisture content and Yield of Maize (Zea mays L.) in Tolon District of Northern Region, Ghana, Greener Journal of Agricultural Sciences, 5(7), 265-277.
9) Shiyu Zhang, Muneta Yokomatsu: Disaster Risk and Effect of Informal Insurance on Human Capital Formation in Rural Areas of Developing Countries, Journal of Integrated Disaster Risk Management, Vol.4, No.2, pp.27-49, 2014.

Output 3

1) Fujihara, Y., Yamada, R., Oda, M., Fujii, H., Ito, O., Kashiwagi, J.: Effects of puddling on percolation and rice yields in rainfed lowland paddy cultivation: Case study in Khammouane province, central Laos, Agricultural Sciences, Vol. 4, No. 8, pp.360-368, 2013.
2) Uchino, H., Watanabe, T., Ramu, K. Sahrawat, K. L. Marimuthu, S., Wani, S. P., Ito, O.: Calibrating Chlorophyll Meter (Spad-502) Reading by Specific Leaf Area for Estimating Leaf Nitrogen Concentration in Sweet Sorghum. Journal of Plant Nutrition, Vol. 6, No. 10, pp. 1640-1646, 2013.
3) Boafo, Y. A., Asiedu, A. B., Addo, K. A., Antwi, K. E., and Boakye-Danquah, J.: Assessing Landcover Changes from Coastal Tourism Development in Ghana: Evidence from the Kokrobite-Bortianor Coastline, Accra, Civil and Environmental Research, Vol. 6, No. 6, pp. 9-19, 2014.
4) Antwi, E.K., Boakye-Danquah, J., Boahen, A.S., Yiran, G., Seyram, K.L., Awere, G.K., Abagale, F.K., Asubonteng, K.O., Attua, M.E., and Owusu, A.B.: Land Use and Landscape Structural Changes in the Ecoregions of Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 452-467, 2014.
5) Avornyo, V.K., Ito, O., Kranjac-Berisavljevic, G., Saito, O., and Takeuchi, K.: Cropping Systems in Some Drought-Prone Communities of the Northern Region of Ghana: Factors Affecting the Introduction of Rice, Journal of Disaster Research, Vol. 9 No. 4, pp. 475-483, 2014.
6) Boafo, Y.A., Saito, O., and Takeuchi, K.: Provisioning Ecosystem Services in Rural Savanna Landscapes of Northern Ghana: An Assessment of Supply, Utilization, and Drivers of Change. Journal of Disaster Research, Vol. 9 No. 4, pp. 501-515, 2014.
7) Boakye-Danquah, J., Antwi, E.K., Saito, O., Abekoe, M.K., and Takeuchi, K.: Impact of Farm Management Practices and Agricultural Land Use on Soil Organic Carbon Storage Potential in the Savannah Ecological Zone of Northern Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 484-500, 2014.
8) Kranjac-Berisavljevic, G., Abdul-Ghanyu, S., Gandaa, B.Z., and Abagale, F.K.: Dry Spells Occurrence in Tamale, Northern Ghana – Review of Available Information. Journal of Disaster Research, Vol. 9 No. 4, pp. 468-474, 2014.
9) Kusakari, Y., Asubonteng, K.O., Jasaw, G.S., Dayour, F., Dzivenu, T., Lolig, V., Donkoh, S.A., Obeng, F.K., Gandaa, B., and Kranjac-Berisavljevic, G.: Farmer-Perceived Effects of Climate Change on Livelihoods in Wa West District, Upper West Region of Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 516-528, 2014.
10) Lolig, V., Donkoh, S.A., Obeng, F.K., Kodwo, A.I.G., Jasaw, G.S., Kusakari, Y., Asubonteng, K.O., Gandaa, B., Dayour, F., Dzivenu, T., and Kranjac-Berisavljevic, G.: Households' Coping Strategies in Drought- and Flood-Prone Communities in Northern Ghana, Journal of Disaster Research, Vol. 9 No. 4, pp. 542-553, 2014.
11) Otsuki, K., Jasaw, G.S., and Lolig, V.: Framing Community Resilience through Mobility and Gender, Journal of Disaster Research, Vol. 9 No. 4, pp. 554-562, 2014.
12) Apronti, P.T.; Osamu, S.; Otsuki, K.; Kranjac-Berisavljevic, G. Education for Disaster Risk Reduction (DRR): Linking Theory with Practice in Ghana's Basic Schools. Sustainability 2015, 7, 9160-9186.
13) Jasaw, G.S., Saito, O. and Takeuchi, K.: Shea (Vitellaria paradoxa) Butter Production and Resource Use by Urban and Rural Processors in Northern Ghana, Sustainability, 2015, 7, 3592-3614

14) Yaw Agyeman Boafo, Osamu Saito, Godfred Seidu Jasaw, Kei Otsuki, Kazuhiko Takeuchi, Provisioning ecosystem services-sharing as a coping and adaptation strategy among rural communities in Ghana's semi-arid ecosystem, Ecosystem Services, Volume 19, June 2016, Pages 92-102

15) Boafo, Y.A., Saito, O., Kato, S., Kamiyama, C., Takeuchi, K., Nakahara M.,: The role of traditional ecological knowledge in ecosystem services management: the case of four rural communities in Northern Ghana, International Journal of Biodiversity Science, Ecosystem Services & Management

Output 1~3

1) Antwi, E.K., Otsuki, K., Saito, O., Obeng, F.K., Gyekye, K.A., Boakye-Danquah, J., Boafo, Y.A., Kusakari, Y., Yiran, G.A.B., Owusu, A.B., Asubonteng, K., Dzivenu, T., Avornyo, V.K., Abagale, F.K., Jasaw, G.S., Lolig, V., Ganiyu, S., Donkoh, S.A., Yeboah, R., Kranjac-Berisavljevic, G., Gyasi, E.A., Minia, Z., Ayuk, E., Matsuda, H., Ishikawa, H., Ito, O., and Takeuchi, K.: Developing a Community-Based Resilience Assessment Model in Northern Ghana. Journal of Integrated Disaster Risk Management.

Note: This is a result that the Project classified the papers into the most related Output. One article may not be related to only one Output.

Source: SATREPS Final Report, July 2016

２．面談録

日　時：2016 年 8 月 8 日 16:15～17:00
場　所：WRC（アクラ）
出席者：Dr. Bob Alfa（WRC 研究員）

WRC について：

- ガーナの水源管理において、政策、制度面でガーナ政府のアドバイザーとしての役割をもつ。WRC は WRI をサポートする立場。
- プロジェクト開始から 2015 年までは､オブザーバーとしてプロジェクトにかかわっていたが、2015 年より C/P として参加。
- プロジェクトの成果として構築されたモデルは、ガーナにこれまでにないモデルであるため、適合するデータの入手が困難であることや、その成果を簡単に活用できないことが多かった。そのため、WRC と WRI が協力することで、ガーナで使われているモデルをプロジェクトに提供し、洪水予想モデルの最適化に取り組んでいる。

プロジェクトについて：

- プロジェクトの妥当性は高く、ガーナ政府の方針と一致している。ただし、プロジェクトの実施においては、データの収集が課題。
- ガーナモデルの定義は十分に有用であるが、現時点ではガーナモデルを構成する各コンポーネントの達成状況に差があり、これらを統合することが課題である。達成が遅れているコンポーネントには更に時間を与える必要があるのではないか。
- 持続性の課題として、プロジェクト終了後の予算確保が挙げられる。プロジェクトの活動を日常業務に組み込むことができれば、安定的な継続が可能かもしれない。また、G-Met の気象予測の精度は十分である。空港運営会社から資金を獲得する道も考えられる。
- あまりお金のかからない手段でのデータ入手ができれば、持続性の向上につながるのではないか。WRC も、データ入手の費用を考慮したうえで、活動を実施している。

技術移転について：

- Bob Alfa 氏が参加した本邦研修（流量データ解析）は、ガーナにとって新しい技術であり、非常に有用であった。ただし、新しい技術を学ぶのに 1 カ月間は少ない。
- プロジェクトはガーナ側の若い研究者の育成に貢献し得る。これは、将来的な研究の継続にもプラス要素である。
- 日本側の専門家とのコミュニケーションに問題はない。基本的には WRC のアドバイザーとして、WRI を通じて連絡を取るが、必要に応じて直接日本人専門家とのやり取りを行っている。
- 関係省庁とのコミュニケーションについては、関連する機関（G-Met、WRI 等）との連携について問題はない。

今後の課題：

- プロジェクトの終了までには、すべての成果を最低でも 90%以上達成し、その結果（Harvest）を関係者に広く適切に伝えることが、ガーナモデルの普及につながる。
- プロジェクトの成果を、適切な相手（政策決定者、予算配布に影響力のある人など）に伝える必要がある。

日　時：8 月 9 日 09:00～9:40
場　所：UNU-INRA（アクラ）
出席者：エリアス・アユク（UNU-INRA 所長）

- 研究成果 3 では、社会経済的なアプローチに主眼を置いて活動を実施している。適切な人材を適切な活動に配置できるように考慮した。
- 成果 3 の特に重要な収穫は、多くの重要な論文が出版されたことである。
- 日本側、ガーナ側の連携について問題はみられない。サイトセレクションの際には 3 つの研究チームが議論をしながら、選定プロセスを進めてきた。このような連携はとても重要であったと考える。
- 日本側、ガーナ側双方のコミュニケーションに特に問題はみられず、ガーナ側研究者間での情報共有も、完ぺきではないとはいえ、十分に行われてきた。
- ガーナモデルの普及については、Key となる関係機関の巻き込みが必要である。また、JCC の機会を利用した、政策決定者への働きかけも重要であり、それに取り組んできた。仮に、ガーナモデルがプロジェクト終了までに政策に組み込まれることがなくとも、ガーナ関係者の意識の向上につながる。
- UNU-INRA ではプロジェクトが供与した GIS ソフトウェア、GPS を活用し、GIS ラボを運営。年に 4 回程度、GIS の能力強化コースを提供している。これらの活動は、今後も継続される予定である。GIS コースには外部からの参加者も多い。
- ガーナモデルを政策に取り込むことは決して容易ではない。ガーナ側のオーナーシップと、明確なビジョンが必要である。
- 成果 2 の持続性については、G-Met の予算確保が課題ではあるが、USAID のプロジェクトと連携するなどの解決法も考えられる。（→他ドナーの資金についても、財務省を経由して G-Met に配布されるため、財務省の決定によるところが大きい）
- プロジェクト目標については、プロジェクト終了後までに 80%程度は達成されるであろうと予想。現在、プロジェクトは発表された論文の成果をまとめる段階にある。

日　時：8 月 9 日 10:15～10:35、16:20～17:00
場　所：G-Met（アクラ）
出席者：Gp. Capt. Stephen Y. Komla、Mr. Ayilari-Naa Juati（ディレクター）

- 4 名が WRF のトレーニングを受けており、能力強化が行われた。研修を受けた予報官はその知識を同僚にシェアしており、効果はとても高かった。
- WRI、WRC、UG との連携も十分に取れている。
- AWS の情報は信頼性も高く、プロジェクトによる重要な投入であった。WB の設置した AWS とあわせ、ボルタ流域のサーバーを導入している。ただし、メンテナンスに課題が残る。現時点では予算確保が困難な状態にある。
- 通信料については、大した金額ではない（約 10 セディ/月/1 台）程度。それでも、財務省から配布された予算が少ないため、常に予算不足。他ドナー（WB、GIZ、USAID 等）からの資金獲得についても、これらの資金は財務省を通さなければならないので、難しい。

- プロジェクトにより移転された技術はとても重要であるので、プロジェクト終了後にも通常業務内で活用、発展させていきたい。北部でのデータについても、精度が高まっているため、NGO等からのニーズも高い。
- 課題は予算であるが、その予算も改善される希望はある。現在 G-Met は空港会社から、飛行機の発着料金の 10%、5 ドル/1 人の空港使用料をもらっている（Parliament ACT 682 に基づく）。航空会社は 2 社に分かれており、A 社 40%、B 社 60%の発着料金の分配があるが、G-Met がもらえるのは A 社の 10%となっている。これはガーナの Act で決まっているが、B 社の 10%も、G-Met に入るように法令の改定を議会で検討中。2016 年末の選挙前には決着がつく見込み。その場合、2006 年からさかのぼって、差額が支払われるが、金額は 300 万ドルを超える見込み。これが解決されれば、予算確保が改善される。また、その場合、プロジェクトの支援の成果はとても重要であると認識しているため、優先的に予算の配布を行う予定。
- AWS、雨量計のデータは信頼性が高く、手間がかからないため重要であると認識している。頻繁に設置場所に行って確認することはできないが、セキュリティ面でもフェンスを設置するなどして対応している。定期的なメンテナンスや、交換部品の調達はバイサラ社が行う。
- 現在 2 カ所でバッテリーが切れているという報告がある。タマレ、コマシの技術者が修理対応をする。
- AWS のデータは、現地の NGO の関心も高く、WB のボルタ流域洪水リスクマップの作成にも貢献している。
- プロジェクトの支援で取り組んでいる WRF モデルも、とても重要。先日、近隣国との国際会議の際にも、他国からの WRF への興味が高かった。

日　時：8 月 8 日 11:20～12:30
場　所：WRI（アクラ）
出席者：K.Kankam-Yeboah（チーフサイエンティスト）、 Frank Teye OBLIM、Fred Yaw LOGAH（研究員）

- WRI は、水資源管理の研究機関として、成果 2 の水関係を担当。プロジェクトの研究に必要な過去の水文データを提供。
- 2 名が本邦研修に参加し、その成果を他の職員に伝えている。研修後のモチベーションもかなり高く、積極的に業務に活用している。供与された、トータルステーション、ビデオカメラを使った、新しい流量測定の技術は、とても有効である。今後更に学んでいきたい。供与された機材のメンテナンス業者は国内にいるため、維持管理も問題がない。
- 本邦研修の期間は適切であったが、もっとほかのことも学べる機会があれば更によい。
- WRC、UDS、G-Met との連携は十分に取れていると考える。他の成果のとの連携は必要に応じて。
- 2015 年からの参加であり、直接的な C/P ではないため、CECAR の資金を使えないことが残念。
- プロジェクトで移転された技術は少ない努力で最大限の成果を上げられる。
- プロジェクトの目的はガーナ政府の方針や SDG にも整合しており、妥当性は高い。
- CECAR フェーズ 2 など、日本の更なる支援に期待したい。

日　時：8 月 9 日 14:00～15:20
場　所：UG（アクラ）
出席者：Richmond Amtefe, Dina Adjei Mensah, Issac Botchey（研究員、昨年から追加）。Dr.K.Awere Gyeke（lecturer）

- 日本人専門家とは、メールを通じた頻繁なやり取りでコミュニケーションをとっている。滞在期間の短さはあるが、できる限り限られた時間を有効に使うようにしている。
- 研究員はそれぞれの分野で、プロジェクトを通じた知識の向上を感じている。UG 研究員の能力向上に寄与している。
- プロジェクトはクロスカッティングなデザインになっており、プロジェクト開始当初より多くの関係機関がかかわってきた。サイトセレクションについても、3 つの研究チームが議論をしながら進めてきたが、苦労の多いプロセスであった。
- 今後の課題は、各成果をどうハーモナイズさせていくかであろう。
- ガーナモデルは、他地域へも拡大されていくべきもの。そのためには、テストをする期間も必要。実際に運用をして、テストをして改善をしていくプロセスを考えなければならない。
- ほかの機関との内部的なコミュニケーションはとれている。必要なデータがあれば、関係機関から協力してもらう体制もある。また、JCC、WS、セミナー等の発表の機会を通じて、情報や成果の共有も行われている。
- UG は CECAR に対して、非常にたくさんの貢献をしている。予算面で問題もあるが、東大関係者がいない間に、研究のためにフィールドに行くこともあった。
- 本邦研修参加者は、帰国後に積極的にその知識を活用する努力をしている。
- プロジェクトの妥当性は非常に高く、コミュニティに対するインパクトも高い。また、若い研究員の育成が進んだことは大きな価値がある。プロジェクト目標である統合的レジリエンス強化戦略については、テストをする期間が必要。
- 武内先生をはじめ、日本の専門家に感謝をしている。

日　時：8 月 10 日　15:00～16:20
場　所：UDS（ワ）
出席者：Fian Naah Ali Seidu（Planning officer, Wa west district office）、Nujeeb Adams（UDS 研究員）、Joseph Kambunada(MoFA)、Dramani File(Head of Operation, NADMO)、Dr.Jonas Akurigu（Senior lecturer）、Mr. Godfred Jasaw

- CECAR は地域の課題であるレジリエンス強化に大きく貢献している。
- プロジェクトを通じて、地域の関係機関の協力関係が構築され、機能している。研究者の能力向上についても大きな進展がみられた。また、WS を通じて、NADMO、MoFA といった関係機関の能力向上もあった。コミュニティの意識向上もみられる。
- 気候変動に対して安定的に生産できる作物の提案は、農民にとって大きな裨益効果。
- 農民の技術の向上も進み、収入の多様化につながっている。
- 課題としては、本プロジェクトでカバーできたコミュニティの数が少ないこと。今後大規模に展開していくためには、実施パートナーが必要。スケールアップのプロポーザルを作成したい。

- 持続性については、KTCSR が大きな役割を果たす。プロジェクトで供与された機材を活用、C/P との協力関係や能力強化のショートコースを提供し、プロジェクトの成果を維持していく予定。UDS は KTCSR のスタッフ給与を負担。
- 日本、ガーナの専門家間のコミュニケーションは極めて良好。地域の関係者を含めた三方向のコミュニケーションが十分な頻度で行われている。また、成果 3 の研究者間の情報共有も良好、ほかの成果との連携は、研究者間の個人ベースの情報共有ができている。
- 日本人専門家の滞在の前には細かい調整をしており、日本人専門家が来た際には、NADMO や MoFA といった関係機関にも必ず顔を出す。
- 成果 3 の指標は、ほぼ達成済み。シアバター、オクラのマニュアルがプロジェクト終了までには完成予定。
- ガーナモデルについては、既に概念図が議論されており、プロジェクトの終了までには目標は達成される見込み。政策への打ち込みについても、政府の有識者として政策決定にかかわるメンバーがいるため、国家計画の策定に大きなインパクトが期待できる。
- 現地での活動においては、ガーナ側の政府職員への日当の支払いなどで、課題があった。フィールドトリップに出る際の日当などの手当てが支払えないことが阻害要因。プロジェクト終了後には、資金の確保が重要である。
- プロジェクト前半ではデータ収集に時間を要し、これまでの研究成果を実証するための十分な時間が取れなかったことも問題点。


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