

Country Name	Project for Capacity Development for Promoting Rural Electrification Using Renewable Energy
Republic of Kenya	

I. Project Outline

Background	<p>Although the Ministry of Energy (MOEn) and the Rural Electrification Authority (REA) had been promoting electrification of unelectrified areas, the electrification rate of rural areas in Kenya as of 2009 was less than 10%. Most of renewable energy facilities in the unelectrified areas were small-scale; however, the local needs for electrification were very high, and challenges were to create models for the use and dissemination of appropriate technologies.</p> <p>As for technological development and research related to rural electrification by renewable energy, efforts had been made to improve adaption and durability of models; however, very few of them have reached the stage of widespread use and practical application. In terms of educational activities, there was no systematic course such as the "Renewable Energy Course," but only individual course items, and it was recognized that there was much room for improvement in both curriculum and teaching materials.</p> <p>As the quality of design and construction of power generation facilities using renewable energy by technicians from private contractors was not always high, the need for human resource development to promote rural electrification using renewable energy was rapidly increasing in Kenya. Also, securing the number and quality of trainers was an urgent issue.</p>												
Objectives of the Project	<p>Through (i) conducting joint researches, (ii) improving under and post-graduate education activities and (iii) preparing and conducting training program, the project aimed strengthening the capacity of Jomo Kenyatta University of Agriculture and Technology (JKUAT) on research and development (R&D), Education and Training in the field of rural electrification using renewable energy, thereby contributing to strengthening the technologies and human resources for rural electrification using renewable energy.</p> <ol style="list-style-type: none"> Overall Goal: Technologies and human resources for rural electrification using renewable energy are strengthened. Project Purpose: Capacity of JKUAT in R&D (research and development), Education and Training in the field of rural electrification using renewable energy are strengthened in collaboration with other stakeholders in the field. 												
Activities of the project	<ol style="list-style-type: none"> Project site: Nairobi Main activities: (i) conducting joint researches, (ii) improving under and post-graduate education activities and (iii) preparing and conducting training program Inputs (to carry out above activities) <table border="0" style="width: 100%;"> <tr> <td style="width: 50%;">Japanese Side</td> <td style="width: 50%;">Kenyan Side</td> </tr> <tr> <td>1) Experts: 21 persons</td> <td>1) Staff allocated: 24 persons</td> </tr> <tr> <td>2) Trainees received: 12 persons</td> <td>2) Land and facilities: Expert's office, training and laboratory spaces were provided.</td> </tr> <tr> <td>3) Equipment: lab equipment, vehicle, PCs and others</td> <td></td> </tr> <tr> <td>4) Local cost: Operation cost, R&D and training</td> <td></td> </tr> </table> 			Japanese Side	Kenyan Side	1) Experts: 21 persons	1) Staff allocated: 24 persons	2) Trainees received: 12 persons	2) Land and facilities: Expert's office, training and laboratory spaces were provided.	3) Equipment: lab equipment, vehicle, PCs and others		4) Local cost: Operation cost, R&D and training	
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Project Period	(ex-ante) June 2011-May 2015 (actual) August 2011-January 2017 (Extended period: August 2015-January 2017)	Project Cost	(ex-ante) 253 million yen, (actual) 481 million yen										
Implementing Agency	Institute of Energy, Environment and Technology (IEET), Jomo Kenyatta University of Agriculture and Technology (JKUAT)												
Cooperation Agency in Japan	Ashikaga Institute of Technology, Osaka City University												

II. Result of the Evaluation

< Special Perspectives Considered in the Ex-Post Evaluation >

- Continuation status of the project effects are analyzed as factors to achieve the Overall Goal.

I Relevance

<Consistency with the Development Policy of Kenya at the Time of Ex-Ante Evaluation >

The project was consistent with the development policy of Kenya. The "Vision 2030", a Kenya's national development plan, aims to transform the country into a newly industrialized nation in order to improve the lives of its people, and positions energy as the foundation for achieving economic, social, and political development.

<Consistency with the Development Needs of Kenya at the Time of Ex-Ante Evaluation >

The project was consistent with the development needs for renewable energy. Rural electrification of unelectrified areas was highly needed, as the electrification rate of rural areas in Kenya as of 2009 was less than 10%. However, there were challenges of creating models for use and dissemination of appropriate technologies. Very few researches related to the rural electrification by renewable energy had reached the practical adaptation, there was no systematic degree course on the renewable energy, and the technicians needed to upgrade their skills as the quality of design and construction of the facilities related to the renewable energy were low.

<Consistency with Japan's ODA Policy at the Time of Ex-Ante Evaluation>

The project was also consistent with Japan's ODA policy to Kenya. Based on the Country Assistance Program to Kenya (2000), economic infrastructure development including energy is one of the priority areas of ODA to Kenya.

<Appropriateness of Project Design/Approach>

Although the project was very much aligned to the core mandate of the university, the Overall Goal, especially in the R&D aspect has not been achieved. This is partly because of the time allotment of individual lecturers for the research under the project was limited, as they had to fulfil their core mandate of teaching and were left with little time to follow up the project research as they should have. Research coordination between Kenya and Japan side had a delay in terms of communication. And generally, R&D activities take time to realize results and only this component delayed. As such, though some problem in implementation process was observed (lecturer's priority on the research under the project was low), the approach was generally appropriate.

<Evaluation Result>

In light of the above, the relevance of the project is high

2 Effectiveness/Impact

<Status of Achievement of the Project Purpose at the time of Project Completion>

The project achieved the Project Purpose at project completion. The total number of presentations in 2016 exceeded the plan (11 versus 9) (Indicator 1), 5 research findings were piloted in relative to the planned 4 (Indicator 2), annual intake of participants in training on renewable energy for rural electrification in 2016 was 82 relative to the planned 80 (Indicator 3), in total, 28 members became trainers on renewable energy technologies against target number of 5 (Indicator 4). IEET Director and Deputy Vice Chancellor Academic Affairs confirmed during the time of ex-post evaluation survey that recommendations for further improving R&D and education activities on renewable energy for rural electrification are in the Senate Minutes (Indicator 5, 6), training program business plan of JKUAT on renewable energy for rural electrification is acknowledged by University Management Board (Indicator 7), though evidences i.e., Senate Minutes and University Management Board Minutes) were not located. Recommendations on licensing concerning renewable energy were acknowledged by Energy Regulatory Commission (ERC) (Indicator 8).

<Continuation Status of Project Effects at the time of Ex-post Evaluation>

The effects of the project have continued after the project was completed. The continuation status of the project effects is analyzed as factors to achieve the Overall Goal (Indicator 1,3,4,5), such as piloting for commercialization of the research findings, continuation of training/human resource development on rural electrification. <Status of Achievement for Overall Goal at the time of Ex-post Evaluation>

The Overall Goal has been partially achieved. Additionally, 3 research findings have been piloted for commercial use (Indicator 1), Biogas Purification System have been successfully installed in various Counties, though 4 technologies in total were expected to be commercialized (Indicator 2), 18 graduate students in Master degree and Ph.D. courses completed dissertation on renewable energy for rural electrification after the project completion (Indicator 3), 638 technicians cumulatively completed T1/T2¹ solar-photovoltaic (PV) training with certification by National Industrial Training Authority (NITA) and licensing for T1, T2 and T3 technicians by Energy and Petroleum Regulatory Authority (EPRA, formerly ERC) (Indicator 4), and 300 people participated in one-day familiarization visit to IEET, but without certification (Indicator 5).

As for R&D, due to high staff-turnover of researchers in IEET/JKUAT, there were delays in completion of the joint research projects partly because data collection and analysis was not able to be completed as planned, and piloting and commercialization have been delayed. Regarding the education, in addition to the increase in the number of Master and Ph.D. students in renewable energy, it was verified that a new BSc course on Environmental Physics and Renewable Energy was introduced in 2017 and heavily relied on project recommendations. Further, there is the increasing potential of renewable energy advancement and sustainability at IEET, JKUAT namely; to start a Master of Science in Climate Change Management and Governance.

During the implementation of the project, the focus was very much placed on the solar-PV training courses. Implementation model for solar-PV training was developed by IEET and rolled out. IEET collaborated with other stakeholders such as NITA, EPRA and Kenya Renewable Energy Association (KEREAA), the latter funded the training, to conduct training at Technical Training Institutes (TTIs). 638 technicians mentioned above (Indicator 4) have participated in the training at TTIs (the project targeted 13 TTIs) or other training institutes with the trainers trained under Training of Trainers (TOT) of the project. And the courses rollout to TTIs have been facilitated and monitored by IEET.

During the ex-post evaluation survey, the evaluation team visited TTIs to monitor their T2 training courses. At one TTI, they have been conducting a 2-week T2 course which had 10 trainees and 4 trainers. It was quite efficiently establishment since 4 trainers (with certificates by the project) teach 10 trainees. In addition, they introduced the same training style which they have learnt through the project. It enhances thinking power of trainees. They also provided the textbook which was used at the TOT.

As for the continuity of the project outputs, training materials in solar-PV, hydro, biogas, wind developed through the project continues to be updated and utilized as a continuous process. However, necessity for a more comprehensive approach to make them more relevant in accordance with the technology change has been observed, on the information provided by IEET. This means that the teaching methodologies as well as the course content in the training manual need to be revised in sync with the recent scientific facts and emerging technological development. The number of trainers (at JKUAT and TTIs) has increased after the project was completed. At the time of ex-post evaluation, there were 52 trainers for solar-PV, 7 small wind energy trainers and 10 biogas power generation trainers. All the Equipment provided by the project have been continuously used.

<Other Impacts at the time of Ex-post Evaluation>

Positive impacts on gender perspective have been observed. The project trained a number of women in the projects thematic areas, adding to the pool of knowledge and increasing the number of trainers as well as researchers. Hydrant technology and biogas cooking under the pilot research have had a preserve of women. So that the benefits of bringing potable water to near home as well as clean cooking (compared to the traditional cooking which uses firewood and smokes accordingly) have improved the livelihood. Increase in revenue for female farmers at a hydrant site have been observed as the custodians, they have continued water supply for irrigation using hydrant to grow vegetables and tomatoes for sale. Total estimated no. of women and girls benefitted from hydrant technology would be approximately 130. Also, women group improved revenue due to biogas used in cooking fish eateries in Kisumu.

No negative impacts on the natural environment are observed.

¹ The Energy Regulatory Commission (ERC) issued a decree in 2012 to improve the quality of PV installation work, including the requirement that technicians involved in the installation obtain a license. These licenses are divided into T1 to T3 levels, and each license holder is allowed to install at a certain level. The project targeted T1 and T2 level licenses.

<Evaluation Result>

Therefore, the effectiveness/impact of the project is high.

Achievement of Project Purpose and Overall Goal

Aim	Indicators	Results	Source										
<p>(Project Purpose) Capacity of JKUAT in R&D (research and development), Education and Training in the field of rural electrification using renewable energy are strengthened in collaboration with other stakeholders in the field.</p>	<p>Indicator 1: Annual number of presentations on research findings on renewable energy for rural electrification exceeds 9.</p>	<p>Status of the achievement: achieved (Project completion) In 2016, the total number of presentations at the conference or accepted paper was 6. Additionally, 5 presentations about research findings were made during the final seminar in November 2016 which makes the total number of presentations as 11. (Ex-poste evaluation) -Refer to the Overall Goal below (Indicator 3).</p>	<p>JICA documents</p>										
	<p>Indicator 2: At least 4 research findings are piloted for commercialization.</p>	<p>Status of the Achievement: achieved (Project completion) Following five field tests and monitoring activities were considered as piloting. 1. Biogas digester, biogas clean-up equipment, and generator set up and operated by NGO in Kisumu ; 2. Bio-gasifier was fabricated and tested for its performance at JKUAT ; 3. Solar home systems with pilot type 12V lead free batteries were installed at JKUAT and will be monitored until Jan. 2017 ; 4. Hydram was installed in Nyeri/Kerugoya and will be monitored until Jan. 2017 ; 5. 200W small wind generation system was fabricated at JKUAT and will be monitored until Jan.2017. (Ex-post Evaluation) Refer to the Overall Goal below (Indicator 1).</p>	<p>JICA documents</p>										
	<p>Indicator 3: Annual intake of participants in training on renewable energy for rural electrification exceeds 80.</p>	<p>Status of the achievement: achieved (Project completion) In 2016, four training courses were conducted with the participants of 82. (Ex-post Evaluation) Refer to the Overall Goal below (Indicator 5).</p>	<p>JICA documents</p>										
	<p>Indicator 4: At least 5 JKUAT members newly become trainers in training program on renewable energy for rural electrification.</p>	<p>Status of the achievement: achieved (Project completion) In total, 28 members became trainers on renewable energy technologies against target number of 5.</p> <table border="1" data-bbox="628 1137 1241 1312"> <thead> <tr> <th>Trained technology</th> <th>No of trainers</th> </tr> </thead> <tbody> <tr> <td>Solar PV Technology Trainers</td> <td>18</td> </tr> <tr> <td>Small Wind Energy Trainers</td> <td>3</td> </tr> <tr> <td>Biogas Power Generation Trainers</td> <td>7</td> </tr> <tr> <td>Total</td> <td>28</td> </tr> </tbody> </table> <p>(Ex-post Evaluation) Refer to the Overall Goal below (Indicator 5).</p>	Trained technology	No of trainers	Solar PV Technology Trainers	18	Small Wind Energy Trainers	3	Biogas Power Generation Trainers	7	Total	28	<p>JICA documents</p>
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<p>Indicator 5: Recommendations for further improving R&D on renewable energy for rural electrification in JKUAT is acknowledged by Senate.</p>	<p>Status of the achievement: achieved (Project completion) IEET Director just confirmed it is in Senate Minutes. (Ex-post Evaluation) Based on the recommendation, all 4th year students doing BSc in Renewable Energy and Environmental Physics take compulsory research project equivalent to two units. Research topic in Renewable energy were popular and utilize the recommendations made by the project for the improvement of R&D in solar-PV, hydro, small wind turbine, which in turn had been heavily influenced by the project.</p>	<p>1. JICA documents 2.IEET</p>											
<p>Indicator 6: Recommendations for further improving education activities on renewable energy for rural electrification in JKUAT are acknowledged by Senate.</p>	<p>Status of the achievement: achieved (Project completion) IEET Director confirmed it is in Senate Minutes. IEET Director and Deputy Vice Chancellor Academic Affairs and confirmed that both approvals were done based on the approved and rolled out to Bachelor course syllabus on Environmental Physics and Renewable Energy. (Ex-post Evaluation) BSc in Renewable Energy and Environmental Physics course got Senate approval and rolled out in the university since 2017. The renewable energy topics in solar-PV, small hydro, biogas and wind administered by IEET were based on recommendations by the project. Training manuals developed in the project were used in implementing the course so that the recommendations for further improvement of education have been acknowledged by Senate.</p>	<p>1. JICA documents 2.IEET</p>											

	Indicator 7: Training program business plan of JKUAT on renewable energy for rural electrification is acknowledged by University Management Board.	<p><u>Status of the achievement: achieved</u> (Project completion) IEET Director and Deputy Vice Chancellor Academic Affairs confirmed that it is in the Minutes and confirmed that approvals were done. (Ex-post Evaluation) Implementation model for solar PV training was developed by IEET and rolled out in collaboration with other stakeholders. As a rule, training plan can only be implemented upon approval by the Senate and budgetary allocation is approved by the UMB. IEET submits an average budget of 400,000KSH per training to the university management which approves the budget (For solar pv budget training at JKUAT and field monitoring to ITTs). It implies that the training program and business plan must have been approved by Senate and the University Management.</p>	1. JICA documents 2.IEET																					
	Indicator 8: Recommendations on licensing concerning renewable energy are acknowledged by ERC.	<p><u>Status of the achievement: Achieved</u> (Project completion) The existing certification process of PV T1-level and T2-level offered by ERC was reviewed in June 2016 and the recommendations on licensing of solar PV were compiled by PV training experts and the training coordinator. As a result of review, from 2017, NITA became the implementation organization to conduct PV certification examinations for the participants of short courses offered by TTIs and NITA. Participants who passed exams receive certificates from ERC. (Ex-post Evaluation) Refer to the Overall Goal below (Indicator 4).</p>	JICA documents																					
(Overall Goal) Technologies and human resources for rural electrification using renewable energy are strengthened.	Indicator 1: At least 5 research findings are additionally piloted for commercial use.	<p>(Ex-post Evaluation) Partially achieved Technologies additionally piloted are as follows: - Biogas purification - Wind-Vertical Axis wind Turbine - Wind- Horizontal Axis wind Turbine</p>	IEET Training Report																					
	Indicator 2: At least 4 technologies developed/improved by project are commercialized.	<p>(Ex-post Evaluation) Not achieved One technology was commercialized, though other technologies are additionally and successfully piloted.</p> <table border="1" data-bbox="517 1016 1273 1438"> <tr> <td>Technologies</td> <td>The details of technologies and status at the time of ex-post evaluation</td> </tr> <tr> <td>Prototype of lead-free battery</td> <td>Still at research level JKUAT/IEET and a Japanese expert) continue to collect and improve on the data</td> </tr> <tr> <td>Biogas</td> <td>Biogas Purification System have been successfully installed in various Counties - Biogas generation project in Dunga beach continues to date</td> </tr> <tr> <td>Wind power</td> <td>Vertical and Horizontal Axis Wind Technologies (VWT and HAWT) have been developed and being piloted in JKUAT community More research on-going)</td> </tr> <tr> <td>Hydro power</td> <td>Hydram technology being successfully piloted at Ragati and Gikera rivers in Nyeri county and ready for commercialization</td> </tr> </table>	Technologies	The details of technologies and status at the time of ex-post evaluation	Prototype of lead-free battery	Still at research level JKUAT/IEET and a Japanese expert) continue to collect and improve on the data	Biogas	Biogas Purification System have been successfully installed in various Counties - Biogas generation project in Dunga beach continues to date	Wind power	Vertical and Horizontal Axis Wind Technologies (VWT and HAWT) have been developed and being piloted in JKUAT community More research on-going)	Hydro power	Hydram technology being successfully piloted at Ragati and Gikera rivers in Nyeri county and ready for commercialization	IEET Training Report											
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	Indicator 3: At least 18 MSc students complete dissertation on renewable energy for rural electrification after project completion.	<p>(Ex-post Evaluation) Achieved No. of students who completed dissertation for MSc and PhD in Renewable Energy for rural electrification</p> <table border="1" data-bbox="517 1572 1321 1706"> <thead> <tr> <th></th> <th>Project completion</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Master students</td> <td>9</td> <td>1</td> <td>7</td> <td>3</td> <td>3</td> <td>23</td> </tr> <tr> <td>PhD students</td> <td>1</td> <td>1</td> <td>0</td> <td>1</td> <td>2</td> <td>5</td> </tr> </tbody> </table>		Project completion	2017	2018	2019	2020	Total	Master students	9	1	7	3	3	23	PhD students	1	1	0	1	2	5	Graduation booklets
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	Indicator 4: At least 800 technicians complete T1/T2 solar PV training course.	<p>(Ex-post Evaluation) Partially achieved No. of technicians completed T1/T2 solar PV training course</p> <table border="1" data-bbox="517 1814 1337 2011"> <thead> <tr> <th></th> <th>At the project completion</th> <th>2017</th> <th>2018</th> <th>2019</th> <th>2020</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>The number of technicians who complete T1/T2 training</td> <td>372*</td> <td>28</td> <td>15</td> <td>84</td> <td>139</td> <td>638</td> </tr> <tr> <td>The number of T1/T2 training course conducted</td> <td>-</td> <td>1</td> <td>3</td> <td>3</td> <td>13</td> <td>20</td> </tr> </tbody> </table> <p>* Cumulative as of January 2015</p>		At the project completion	2017	2018	2019	2020	Total	The number of technicians who complete T1/T2 training	372*	28	15	84	139	638	The number of T1/T2 training course conducted	-	1	3	3	13	20	Training Records IEET
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	Indicator 5: At least 300 people complete training by IEET on renewable energy for rural electrification after	<ul style="list-style-type: none"> (Ex-post Evaluation) Achieved 300 people participated in official/unofficial one-day familiarization visit to IEET and pilot sites from 2017 to 2021 without certification. the visiting teams come not as general visitors to JKUAT but specifically targeting IEET to be trained on Biogas, 	IEET records																					

	project completion.	Solar-PV and Wind in this "one day training course" <ul style="list-style-type: none"> In addition, 200 member farmers of Sharma Group, which is a farmer group in cash crops and mixed crops agribusinesses from Nyeri County of Mt. Kenya region, received one day structured training mainly on the basics of biogas production, utilization, operation and maintenance. 	
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Source : Questionnaires and interviews with IEET. Documents of JKUAT.

3 Efficiency

The project cost significantly exceeded the plan and the project period exceeded the plan (the ratio against the plan: 190%, 138%). The project was extended for 1.5 years to complete the remaining activities of R&D. The outputs were produced as planned. Therefore, the efficiency of the project is low.

4 Sustainability

<Policy Aspect>

There has been policy support for promoting renewal energy for rural electrification. The Energy Act 2019 emphasizes Renewable generation and Rural Electrification and Renewable Energy Corporation (REREC) was established to oversee the implementation of the Rural Electrification Programme accordingly.

<Institutional/Organizational Aspect>

There has been no change in the structure to disseminate the project effects as per IEET and TTIs as institutions for Technical and Vocational Education and Training structure.

During the project period, a total of 24 staff members of JKUAT were registered as counterparts from various departments as well as IEET. JKUAT needs to take the employment condition attractive to reduce high turnover and retain high level cadre of staff and researchers. NITA and EPRA have had adequate numbers of staff to implement the various training. Both have played a critical role and attend TOT for solar-PV in JKUAT. To train more human resources on renewable energy, the number of trained trainers under the project has been sufficient. JKUAT/IEET has had 24 trainers and the target TTIs (13) have had 2 trainers each.

The management structure at IEET is appropriate for promoting R&D, education and training on renewal energy.

High turnover of researchers at JKUAT has been a problem to continue and expand the research under the project.

<Technical Aspect>

Although high turnover of researchers at JKUATTA has been a problem for continuity and expansion of the research under the project, the trained staff members have continued to disseminate the knowledge and skills gained in in capacity buildings and R&D.<Financial Aspect>

According to IEET, JKUAT Management Board has provided necessary budget for IEET activities (the training activities carried out by IEET at JKUAT level (TOT) and at the TTI level). TTI managements also facilitate the training. However, not enough budget has been allocated. Nonetheless, participants attending the short courses on IEET/JKUAT are fully sponsored by their institutions which pay for these courses to IEET before they are trained. No. of applicants are usually more than IEET can allow in so the demand is high and through this arrangements, JKUAT/IEET is able to recover all their cost of offering the courses.

<Evaluation Result>

In light of the above, not problem has been observed in terms of the policy, institutional/organizational, technical and financial aspects. Therefore, the sustainability of the effectiveness through the project is high.

5 Summary of the Evaluation

The project achieved the Project Purpose at the project completion, as the research findings were piloted, training on the renewal energy was conducted and recommendations by the project on R&D, education, and training and licensing were acknowledged by JKUAT as well as ERC. The Overall Goal has been partially achieved. Technicians have continuously completed T1/T2 training, and more graduate and undergraduate students completed dissertations on the renewable energy, though training on other topics have been limited. Research findings have been additionally piloted and commercialized, though the targets have not been met. As for the efficiency, the project cost significantly exceeded the plan, and the project period exceeded the plan.

Considering all of the above points, this project is evaluated to be satisfactory.

III. Recommendations & Lessons Learned

Recommendations for Implementing Agency:

High turnover of researchers due to insecurity of employment could negatively affect the project impact. Human Resource Department in JKUAT need to consider supporting JKUAT researchers by engaging them on long-term basis instead of temporary with the aim to have a solid renewable energy and training hub in JKUAT.

Lessons Learned for JICA:

Joint collaboration on data sharing and analysis brought about accelerated quality genuine results and better understanding between the Kenyan and Japanese researchers. This situation is better than when each side would be collecting and analyzing their own data and only share final product. In this project, both local data and Japan collected data were transparently shared even when sometimes it would be contradicting for example. This should be emulated in the projects where Japan and Kenyan researchers are working on shared themes through shared data and peer reviewed to come up with the better conclusions.

Utilize above model in future formulation of new technical cooperation projects whereby joint research is a core component with high expectation from both local and Japanese sides (instead of passively local awaiting the Japanese side to deliver results).

There is need to de-link the development of the technology to its mature level by the Academia from the next level of commercializing it. The latter depends on interest or lack of it from the commercial sector who would have the finances to take up the product to a higher level of marketing it. IEET/JKUAT is poorly endowed to accomplish both roles. Or the project needs to include business support as a project activity.

It is very important for JICA and the project team to identify and address the gaps between planning and practice at the earliest possible.

With careful joint planning between the Japanese and Kenyan side, they would have agreed on the timing of the activities together identifying who can do what, when and how with the aim to get things done to minimize the external and internal disruption.



Women inspecting their Hydrum installation at the River Ragati



WOTE (Makueni county) TTI lecturers showing their training equipment for Solar-PV