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UNICAM

*Implementing quality of education training of the young
UNiversities in rural area of CAMbodia*

UNICAM

« Sustainability Plan »

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ANNEX: UNICAM end-users and stakeholders

1. Introduction

UNICAM project has as main goal to attain a more effective, country-owned agriculture and food security through strengthening national capacities. To achieve it, it is necessary to improve the understanding of how the agriculture production and sustainable ecosystems could be related.

In this context, the ultimate beneficiaries are those million people who suffer from food insecurity and contamination. The new perspectives on how to manage and use agro-ecosystems in a sustainable way allows that society could better manage agricultural production by controlling resources and finishing with the unsustainable use of land.

The Sustainability Plan aims to have a long-last impact of UNICAM project results in the Partner Countries represented in the partnership. This is based in four aspects of which its implementation will assure the continuity of the project by itself.



Figure 1. Diagram of UNICAM sustainability plan.

2. UNICAM activities with a long-lasting impact

UNICAM sustainability is based on the following activities and project outcomes:

- The accreditation of a new Master in Sustainable Agriculture (MSA) program following the Bologna principles
- Staff and Institution Capacity Building, through ATCs implementation, exchange programmes and equipment acquisition

- Teaching and learning materials
- The creation of a community of stakeholders and subject matter experts
- Bi-lateral agreements between Partner and Programme Countries to promote the mobility of staff and master students in the future

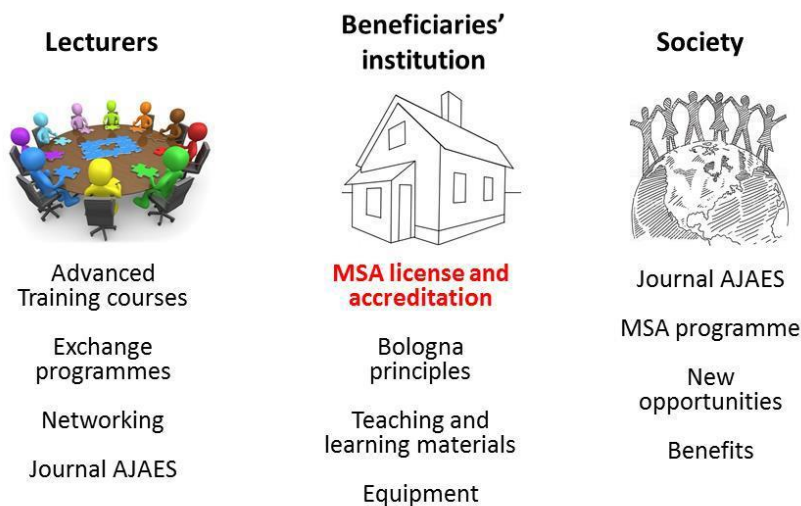


Figure 2. Contribution of UNICAM to the sustainability of the project outcomes and the expected impact on lecturers, beneficiaries' institutions and society.

The accreditation and sustainability of the master program stems from its attractiveness on potential students and the participation of different professional sectors contributing to:

- A systematic evaluation among different programs working in similar field, i.e. rural development and sustainable agriculture, will be a peer review for the quality of new master programs.
- Stakeholders provide practical perspectives on the direct outcomes of the master programs, that is, the quality of the graduated students. The strong connections with stakeholders via talk show, workshops and conference can also provide more job opportunities for graduated students. From that, potential students can be attracted.
- Lecturers/ teachers contribute to internal evaluations which are needed for ensuring the quality of the master programs. As such, opinions of lecturers on the content of project activities, i.e. ATCs and staff mobility, as well as teaching materials are needed.
- Graduate students are a good source of feedback on the quality of the master program and the relevance of its content to the need of their jobs. The opinions of potential students are important to know the attractiveness of the programs to them as well as the methods to increase this measurement.

3. Activities

3.1. Advance Training Courses

UNICAM organizes Advanced Training Courses (ATCs) focused on training staff members from Partner Countries to transfer the acquired competences and skills to prospective students of the master, thus contributing to the sustainability of UNICAM beyond the lifetime of the project.

Given the local shortage of many important competences and skills which are needed in the sustainable agriculture field, numerous specific courses were organized and implemented by Programme Countries (e.g. ATC in advanced statistical models were delivered by UPS). From this, it is expected that the lecturers of local university are able to couple the statistical methodology in data analysis, experiment design, and modelling techniques in the agriculture field. Another important, but often ignored aspect in the development of agriculture in Partner Countries is water resource management, which was covered by two ATCs from UGent, Water Quality Management and Water Quality Modelling. Moreover, the knowledge of other courses which are very relevant to the agriculture sustainability, i.e. Ecotoxicology of Agrochemicals given by UdG, Soil Fauna Ecology and Biology and Biotechnology of Plants by UPS, and Energy and Environment, The Role of Fungi in Sustainable Agriculture and The Role of Microorganisms in Sustainable Agriculture and Biodiversity by UNIVAQ are very applicable in this field. Indeed, basic courses of master programs, i.e. Concept of Sustainable Agriculture, Plant Nutrient and Soil Fertility Management and Agro-Ecosystem Analysis benefit from the lessons learnt these ATCs either .

Besides giving theoretical knowledge and insights on these field, practical skills are also taught, so that the local lecturers can put their knowledge into practical perspectives. For example, the ATC on statistical models also coupled its practical training in R software. Similarly, the ATCs on water resource management combined their theoretical part with laboratory practice and modelling techniques. From this, local lecturers and students can implement a sampling campaign to measure the water quality themselves.

3.2. Teaching and learning materials

Apart from the large amount of theoretical knowledge and practical skills which were transferred to local lecturers to improve their training, ATC lecturers produce learning materials which are updated and adapted to the specific needs of Cambodia concerning sustainable agriculture. A wide variety of teaching materials can be developed to train staff members such as classroom lectures, field work activities, computing activities, seminars, problem-based learning, etc... designed to cover a large set of competences and skills. These materials are fully available for Partner Countries to be used later, after the end of the project, as updated learning materials.

The peer-reviewed Journal (Asian Journal of Agricultural and Environmental Safety) coordinated by UNICAM members will also contribute to provide learning materials by the publication of updated laboratory and field methodologies and Master thesis results. This project output will allow having a long-lasting impact in the Partner countries represented in the partnership, especially on the Higher Education sector as a whole, as well as on the different target groups concerned by the project.

3.3. Exchange programs

The mobility of Cambodian staff to Europe is crucial to improve the knowledge, competences and skills of the staff that will be in charge of the organization and implementation of the MSA. These activities are focused on training (e.g. Communication Skills course at UdG), participating in practical work in the field and in the laboratory, and also making a network between universities. Within the first two years of the project, many core staff participated in these mobilities (e.g. Yean Sambo and Yorn Try went to UPS and Serey Mardy and Tum Saravuth to UdG). As the involved staff have positions of vice rectors or lecturers of the Partner Countries universities, the knowledge and skills learned are totally in line with the purpose of the project. Hence, it is expected that those competences will be passed not just to the first batch of master students but also to the next generations.

To ensure that the top-quality master students also have an opportunity to learn advanced knowledge, innovative technology and professionalism in Europe; 16 scholarships for internship are given within UNICAM project. These students have a chance to go to Europe to perform the practical part of their master thesis. The activity ensures the high quality of their work and also increases substantially by the cooperation between Cambodian and European promoters. As the work in the master theses is also a research topic of European promoters, there is a better chance of publishing these works as scientific articles in ISI journals. More importantly, the fruitful cooperation between Cambodian and European promoters could bring opportunities of future internships for the next batch of master students. In this future scenario, students could have funds from other sources, such as Erasmus mobility grants, VLIR grants (to go to Belgium), etc. Moreover, the cooperation can be further improved as the master programs can be integrated into other international master programs. One example is the International Master of Science in Rural Development in UGent which has now 7 partners from outside Europe (more information: <http://www.imrd.ugent.be/>).

3.4. MSA program

As, according to the World Bank, agriculture accounted for 35 percent of GDP and employed approximately 65 percent of the workforce in 2015, the sustainable development of this sector is of great interest for Cambodia. Indeed, because of the rapid population growth and urbanization, the

balance between increasing agriculture to ensure the economic development and protecting environment is currently under pressure in Cambodia and a main objective for its government. Therefore, the four Master programs in Sustainable Agriculture arranged within UNICAM project are strategically located in different regions in Cambodia to provide a substantial workforce that possesses the knowledge, competences and skills on sustainable agriculture. This will be proved by the number of enrolled students in all four master programs. Moreover, the consistent need of job market is one of the means that ensure the sustainability of the programs.

Moreover, the master program also has strong connection with local stakeholders which increases the practical perspectives of the program and also the job opportunities for graduated students. This is very important as the more job security of the master program, the more enrolled students. More details on the local stakeholders will be provided further in this plan.

The stronger cooperation between Cambodian and European universities will also increase the sustainability of the master programs. Besides the knowledge and skills that EU universities can provide to the local partners, cooperation could also create more research opportunities as well as grant funding, being both very crucial for the sustainability and development of the master program.

3.5. Equipment

For the improvement of training, new equipment is purchased and upgraded as well as new teaching materials are developed and introduced in existing courses each year. During the ATCs, the teaching materials, which are used and taught by professors in four European universities, are transferred completely to the participants who are the lecturers of the new master programs. Hence, these teaching materials could be used in the new master programs. They are also available in the website of UNICAM in order to ensure their availability for a long-term usage. The equipment list of the ATCs is also assessed by partner universities to see their requirements in the new master programs.

The equipment purchased is based on the needs of the new master program to be used by the lecturers. As they have a long-term commitment with the MSA program, the sustainability of the equipment use is ensured.

Details of the sustainable use of the equipment that each Partner country will purchase are shown below:

University of Battambang (UBB)

- Office materials (e.g. laptop, printer, batteries and photocopy machine): improve administrative and academic work to offer the MSA beyond the duration of the project.

- Publications (i.e. flyers and posters) are used as material for outreach of MSA programme, and these will be installed and remain in the office for MSA.
- Equipment (e.g. augers, soil moisture tester, camera, berlese funnels, etc.) will be in the soil science lab and soil museum for students' practical work in several courses, (e.g. "Concept of Sustainable Agriculture", "Plant Nutrient and Soil Fertility Management", "Agro-Ecosystem Analysis").
- Equipment such as a shredder, a gridding of organic material to make compost, microscopes for soil fauna identification and microbiology studies, fan heat movement in greenhouse and textbooks will also be used to carry out the MSA for courses beyond the duration of the project.

Svay Rieng University (SRU)

- Berlese funnels will be used in the laboratory of the Faculty of Agriculture for practical courses for MSA students and staff training courses (e.g. "Plant Nutrient and Soil Fertility Management" and "Soil Fauna Biology and Ecology").

Mean Chey University (MCU):

- Office materials (e.g. printer, LCD, external hard disks, laptops, USB and so on). Administrative and academic work at the Faculty of Agriculture and Food processing will benefit from the use these materials serving to offer the MSA beyond the duration of the project.
- Laboratory equipment (e.g. Laminar flow cabinet, pumper, generator...) will be purchased and placed at the Agronomy Laboratory. Not only UNICAM but also undergraduate program has been sustainably being upgraded though these instalments such as Plant Biotechnology, Soil Science, Entomology, Microbiology, Soilless culture and so on.
- For publications, leaflets and banners will be designed and printed out.

Chea Sim University of Kamchaymear (CSUK):

- Office materials (laptop, printer, external hard disk, HDMI and VGA cables and USB) will be used for daily administrative work and for offering the MSA beyond the duration of the project. For example, laptops are used the preparation of the courses and attending meetings. LCD projector and screens will be installed in the classroom and laboratories. Flyers and banners will be shared out in the offices of the three campuses of CSUK remaining beyond the duration of the project.

- Laboratory equipment (e.g. microscopes, electronic balances, soil moisture testers, cameras, berlese funnels, thermometer for soil, laboratory glassware, mortar and pestle, uniform laboratory clothes, beakers, test tubes, digital timers etc...) are acquired for practical work for undergraduate MSA students and also for its use in the future. Laboratory equipment will also be installed in Kampong Cham Branch for MSA practical work. Otherwise a greenhouse will be installed at the main campus of CSUK for practical work.

3.6. Stakeholders and subject matter experts

Consortium Board members will undertake a continuous search to update the list of stakeholders who contribute to the improvement and prolongation of the project outcomes (see ANNEX).

These stakeholders play a very important role in the development and sustainability of the master programs. During the implementation of the program, their opinions about the content, opportunities and threats are of great interest. Workshops, organized in each university, will contribute to collect the opinions of the local stakeholders. Long-term cooperation between partner universities and local stakeholders is aimed as it brings the benefits to both parties. In the workshops, the local stakeholders give a realistic perspective on the required skills, knowledge and competences that MSA students should have to ensure their opportunities in job market. Feedbacks are very important since high job opportunities increase the attractiveness of the master to the potential students. The tuition fee of these students is hence a mean to ensure the sustainability of the programs in the long-term. On the other hand, these workshops are also a disseminating mean for the programs to be known by the local stakeholders so that their graduated programs can be easily recognized in the job market.

3.7. Memorandums of Understanding (MoUs)

UNICAM facilitates the signature of bi-lateral agreements between Partner and Programme Countries to enhance the staff and student mobility in the future. Indeed, the cooperation between European and Cambodian partners will not be finished after the UNICAM project. As such, several Memorandums of Understanding among partners will be promoted to facilitate this cooperation, i.e. CSUK with UdG; UBB with UdG, UPS, UNIVAQ and UGent. This together with other research cooperation, such as collaboration between MCU and UNIVAQ in the study of diatoms and the full cooperation among all partners in the Asian Journal of Agricultural and Environmental Safety (AJAES) ensures the long-term cooperation among the partners. Noteworthy is that UBB is now also cooperating with UGent, UPS and UdG in another Erasmus+ project, CONSEA. Thought these project, better understanding and stronger foundation between universities have been built, which surely facilitates the future cooperation.



ANNEX

UNICAM end-users and stakeholders



Svay Rieng University (SRU)

Name of Stakeholder / End User	Main Activity	Expectation	Contribution
Institute of Technology and Social Science	Provide training and education to primary and secondary school teachers	Offer the degree of Bachelor to primary and secondary school teachers	<ul style="list-style-type: none"> - Supplying the education to those who wish to pursue Bachelor's degree - Focusing on Technology and Social Science training - Developing human resources in the province
Provincial Department of Agriculture, Forestry and Fisheries	<ul style="list-style-type: none"> - Promoting crop, fish and animal variety - Promoting industrial crops - Forest conservation - Offering agricultural extension to farmers and community - Supply agricultural techniques and equipment to farmers and community - Promote fishery 	<ul style="list-style-type: none"> - Crop, fish, animal production with high yield - To promote farmers' livelihoods - Agricultural community services - Agricultural development 	<ul style="list-style-type: none"> - Promote agricultural marketing - Provincial economic growth - Employ the graduates from university - Offer the internship for MSA and undergraduate students
Provincial Department of Rural Development	<ul style="list-style-type: none"> - Promoting rural clean water and sanitation - Developing rural road - Forming rural community - Collaborating to assess rural credit - Implementing governmental policy and regulations 	<ul style="list-style-type: none"> - Rural community development - To promote farmers' livelihoods - Agricultural community services - Agricultural development 	<ul style="list-style-type: none"> - Promote rural economy - Provincial economic growth - Employ the graduates from university - Offer the internship for MSA and undergraduate students



University of Battambang (UBB)

Name of Stakeholder / End User	Main Activity	Expectation	Contribution
Royal University of Agriculture (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Praek Leap School of Agriculture (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Heng Samrin University of Tbong Khmum (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Ministry of Education, Youth and Sport	Develop human resources and policies	Accreditation and MSA program monitoring and supporting	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To issue the accreditation of MSA programme
International University (Cambodia)	Research and training	One course per year	<ul style="list-style-type: none"> - To teach MSA students for a course on Integrated Natural Resources Management
University of Bengkulu (Indonesia)	Research and training	One course per year and two master theses	<ul style="list-style-type: none"> - To teach MSA students for a course on Integrated Natural Resources Management - To supervise students' theses



Chea Sim University of Kamchaymear (CSUK)

Name of Stakeholder / End User	Main Activity	Expectation	Contribution
Student's alumni	<ul style="list-style-type: none"> - Working in different sector - Next working - Information Distribution channel - Business implementation 	<ul style="list-style-type: none"> - Next work for student employability - Improve employability for graduate student - Experience sharing - Widening relationships 	<ul style="list-style-type: none"> - Tuition fee - Attending in the classroom and research activity - Participating performance, interaction activities and events.
Government	Policy rule and regulation implementation	<ul style="list-style-type: none"> - Market place for graduated student - Get return from what student investment 	<ul style="list-style-type: none"> - Policy Regulation framework - Stable market environment - Financial investment and other support.
Royal University of Agriculture (Cambodia)	Research and training	Three potential human resources per year	<ul style="list-style-type: none"> - To contribute MSA curriculum development - To teach MSA student
Praek Leap School of Agriculture (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Heng Samrin University of Tbong Khmum (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Kampong Chan National School of Agriculture (Cambodia)	Research and training	Two potential human resources per year	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To teach MSA students
Ministry of Education, Youth and Sport (Cambodia)	Develop human resources and policies	Issue of accreditation, and MSA program monitoring and supporting	<ul style="list-style-type: none"> - To contribute to the MSA curriculum improvement - To issue accreditation of MSA program
International University (Cambodia)	Research and training	One course per year	<ul style="list-style-type: none"> - To teach MSA students for a course on Integrated Natural Resources Management
Ministry of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	Two course per year	<ul style="list-style-type: none"> - To provide opportunity for internship - Join research work
Kampong Cham Department of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	Once course per year	<ul style="list-style-type: none"> - To teach MSA students; - Join research work - To provide opportunity for internship
Tboungkhmum	Develop human	One Course per year and	<ul style="list-style-type: none"> - To provide funding support for



Department of Agriculture, Forestry and Fisheries (Cambodia)	resources and policies	provide job to student	students' projects - To provide opportunity for internship
Kampong Thom Department of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	One Course per year and provide job to student	- To provide funding support for students' projects - To provide opportunity for internship
Siem Reap Department of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	Provide job to students	- To provide funding support for students' projects - To provide opportunity for internship
Prey Veng Department of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	Provide job to students	- To provide funding support for students' projects - To provide opportunity for internship
Helen Keller International, NGO, Cambodia	Promote the development of effective solutions to malnutrition	Provide job to students	- To provide funding support for students' projects - To provide opportunity for internship
Caritas NGO, Cambodia	Livelihood food security	Provide job to students	- To provide funding support for students' projects - To provide opportunity for internship
Cambodian Agricultural Research and Development Institute	Research and training	Two courses per year at CSUKs	- To provide opportunity for internship - Join research work



Mean Chey University (MCU)

Name of Stakeholder / End User	Main Activity	Expectation	Contribution
Mean Chey Department of Agriculture, Forestry and Fisheries	Develop human resources and policies	<ul style="list-style-type: none"> - Two students will be supervised by PDA staff - Student get more experiences and knowledge from practical work 	<ul style="list-style-type: none"> - Providing agricultural station for thesis research - PDA staffs support training courses to students without costs - Co-advisor of master theses - Bring student to participate agricultural extension activities
Ockenden organization, Cambodia	Strengthen development planning, management of natural resources, and the environment for business activity to improve livelihoods.	Rice seed production station	Providing site (2.5 ha) for rice seed production and establishing marketing strategies
University of Sydney, Australia	Research and training	<ul style="list-style-type: none"> - Capacity building leadership and management - Capacity building for MCU lecturers including mushroom production, plant diseases, plant breeding, biogas building, especially Integrated pest management 	<ul style="list-style-type: none"> - Providing training course without costs - Providing expert in IPM without cost - Vice rector and dean got train on leadership skill - One lecturer got train on Integrated Pest Management
Crawford Fund, Australia	<ul style="list-style-type: none"> - Support for agricultural research - Practical training for agricultural researchers master 	Providing expert without costs	Plant disease training course
Hanoi National University of agriculture (Vietnam)	Research and training	Providing experts without cost	Two lecturers got trained on Entomology
Institute of Ecology and Biological Resources (Vietnam)	Joint research on insects and plant bio-diversification	Providing expert and lab equipment without cost	One lecturer become an expert in useful insect identification
Lanchau University of agriculture (China)	Research and training	Training course on soil analysis	<ul style="list-style-type: none"> - Providing expert and lab equipment without cost - One lecturer got trained on soil analysis
Ministry of Agriculture, Forestry and Fisheries (Cambodia)	Develop human resources and policies	Two course per year	<ul style="list-style-type: none"> - To provide opportunity for internship - Join research work