

The UVIMA Project

Uchambuzi wa Viumbe kwa Maendeleo
Taxonomy for Development in East Africa

UVIMA Tools and Products Consultancy

Draft Report

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Report Prepared by: Tanzanian Tools & Products Team

Country:	UNITED REPUBLIC OF TANZANIA
Countries Covered by Project:	UNITED REPUBLIC OF TANZANIA
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Guiding Notes: ToRs

1. *Prepare the tools/methodologies for the review and agree them with Project Team.*
2. *Carry out a stakeholder analysis to define institutional landscape and categories of end-users for IAS /pests/pollinators thematic areas at national level.*
3. *Carry out an end user Needs Assessment for taxonomic tools and products for the three themes with special emphasis on those needed by farmers and local communities, for training Para-taxonomists and taxonomists and for use by regulatory agencies e.g. plant health and quarantine, and conservation institutions.*
4. *Document existing tools and products e.g. national checklists, guides, species lists appended to National Legislation, identification keys, etc of the IAS /pests/pollinators and analyse the gaps therein.*
5. *Recommend any other relevant tools and products that would improve in knowledge, identification and / or use of IAS/pests/pollinators at national level in Kenya, Uganda and Tanzania.*
6. *Assess priority tools and products needed for efficient delivery of the UVIMA project objectives, within participating institutions.*
7. *Identify gaps in infrastructure needs of taxonomic institutions for each theme and outline options for further development including useful partnerships and linkages needed for their development at national, regional and international levels.*
8. *Make recommendations on opportunities for and potential for creating and/or strengthening synergies at institutional level in the three themes and collaborations between institutions to reduce duplication of efforts.*
9. *Scope out options for linking with and effectively disseminating tools and products to end-users e.g. farmers and local communities, government agencies, organizations and taxonomic institutions.*
10. *Document and address any other relevant issues concerning tools and products for IAS /pests/pollinators needs not mentioned above.*

Key deliverables

Focus: community, extension, management agencies that are end-users of taxonomic products and tools

Key Questions: What, Where, When, How and Why

Existing tools and products (What, where, why, how) documented
Target users (Stakeholder analysis) of UVIMA products i.e. taxonomic products and tools for invasive, pest and pollinator management to enhance food security, ecosystem services, trade, agricultural productivity and ultimately human well being, environmental integrity and sustainability determined and prioritised
Tools and products that are with end users and which are in use assessed
Means of dissemination for existing products and tools - successes, failures and challenges to avoid – assessed
Suitability of tools and products for key target audiences assessed
The question: which are the weakest links - production of tools that are not suitable for target audience or ineffective dissemination or use of inappropriate or ineffective platforms – answered
Demand for or potential applications of taxonomic products and tools UVIMA could

produce assessed and prioritised
Current and potential infrastructure for developing these tools and products to identify the Niche for the UVIMA project (is the infrastructure such as software and imaging technologies robust enough or does UVIMA need to build on, enhance or otherwise, if so what information / training / software etc is need?) documented.
Existing strategic partnerships and collaborations and the gaps identified

1. Executive Summary

Provide a short summary of key consultancy progress, achievements, issues, constraints, challenges, risks and mitigation measures during the reporting period. This section must be kept very short:

1.1 Key project achievements during the reporting period

Fill-in this table with what you consider to be the most important consultancy achievements in the reporting period.

Nota Bene: All tables are collapsible or expandable depending on the information you have collected.

#	Key Consultancy Achievements
	<insert a short summary of not more than 30 words for each achievement>

2. Tools/methodologies used in the review

For tools and products Meetings, discussions and face-to-face interviews using designed questionnaires were applied in collecting required data and information. The approach took into consideration the followings:

- Local traditional knowledge available in the areas;
- participation by the different stakeholders
- Involvement of the various institutions that are involved in management of pests, invasive species and pollinators in Tanzania mainland;
- Review of already published materials
- We establish local knowledge from farmers through face to face discussion
- Tools (questionnaires, photographs monograph) were used when collecting data and information

2.1 Existing Tools and products

(Institutional and personal documented) in each case. Please fill-in the following table: The information should cover the whole country

Stakeholder	Desired Tools/products
TPRI, UDSM, SUA, TTSA, TAWIRI, TAFORI, TACRI MAFS, ARIs, ZANZIBAR	References collection, database, human resources literature taxonomic equipment oval role, institutional/stakeholder collaboration and partnership

CATEGORY Of existing tools and products	What the tool or product /facility is	Where it is developed	Where it is maintained	Why developed	Target audience	How - approach/method/ design/platform
IAS						
Flora (Herbarium, seed collection and logs)	Identified and pressed specimen, collected identified and preserved.	TPRI Herbarium	TPRI	Enhancement facilitation of IPM strategies	Researchers, extension officers and farmers & Environmentalists	Meetings, seminars, workshops, training and scientific visits.
	Herbarium of identified and pressed specimen, seeds and logs	UDSM-Botany Department	UDSM-Botany Department	Training, References, researches and conservation	Students, Researchers, Academicians, individuals and policy makers	Training, workshops, consultancy, networking with partner institutes and NGOs, orientation visits by policy makers
	Arboretum, Tree Seed collections	Trees seeds collected	TTSA cabinets and cold rooms	Selling to customers	Anybody interested in tree planting,	Meetings, seminars, workshops training and

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	for planting and reference/conservation	throughout Tanzania from local & exotic spp		interested in tree planting, Reference and Taxonomic identification of trees, teaching.	Researchers, botanists, policy makers	scientific visit
	Identified and pressed specimens, Field guides, Leaflets, posters, reports	Uyole Research institute	ARI Uyole Research laboratory	To gain knowledge and enhance IPM promotion in weeds	Researchers, Extension agents, farmers, private agents, students, policy makers	Workshops, seminars, agriculture show displays, visits, field days, training courses, special references
Fauna (Invertebrates and vertebrates)	Collection of Identified and preserved specimen (insects, birds and Rodents)	TPRI Laboratory	TPRI	Taxonomic references, Pest management & training on IPM, regulation and quarantine	Researchers, visiting experts, students, extension officers and farmers.	Meetings, seminars, workshops, training and scientific visits.
	Localized collections of insects usually based on individual projects objectives	Researchers/scientists at UDSM in collaboration with foreign experts and local institutions such as SUA	UDSM-Zoology Department	Training, References, researches and conservation	Researchers, conservators, experts, Students, Academicians, private sectors.	Lectures, workshops, consultancy, networking with partner institutes and NGOs, orientation visits by policy makers, supervision of research works, etc.
	Collection of few destructive insects of exotic tree plants	Entomologist and botanists/foresters at TTSA	TTSA laboratory at the headquarters in Morogoro	Reference and Taxonomic identification of tree pests, teaching, guide to extension officers	Foresters/ botanists, researchers field workers, students, partners in tree production	Consultancy, Meetings, seminars, workshops training and scientific visits, brochures, shows (nanenane & sabasaba), customer outreach programs.
	Collection of few destructive insects of coffee	Researchers/scientists at TACRI	TACRI	Reference and Taxonomic identification of	Researchers, visiting experts, students, extension officers and	Meetings, seminars, workshops, training and scientific visits.

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				coffee pests	farmers.	
	Reference collection of fruit flies	SUA/ Royal Museum for Central Africa (Tervuren, Belgium)	SUA	For identification	Researchers, lecturers and students	Pinned and wet specimen
Databases	Software and hardware	TPRI (National Herbarium)	TPRI	For reference and linking Taxonomic identification	Researchers, extension officers and farmers. Environmentalists	Coursework practical, Research supervision, seminars, scientific visits
	Flora (LEAP), Tree catalogue, TROPICOS & electronic data base	Experts at UDSM-Botany department in collaboration with foreign experts	UDSM-Botany Dept	Training, Reference & Research	Students, Researchers, Academicians, individuals and policy makers	Meetings, seminars, workshops training and scientific visit.
	Flora (LEAP), Tree catalogue (local & exotic), TROPICOS Electronic & electronic data base	Consultant taxonomists, Foresters and Botanists at TTSA	TTSA	Reference, conservation, training.	Environmentalist, foresters, researchers, Students, policy makers	Workshops, Shows, leaflets/brochures, short courses, seminars
Human resources	Scientists/researchers par taxonomists (diploma and certificates)	University output Other institutes.	TPRI (National Herbarium)	For taxonomic identification	Various communities (Technocrats, learners, farmers etc in Tanzania & the region/world)	Training, advisory meetings, seminars, workshops, supervision, and partnership in scientific activities.
	Scientists/researchers (visiting & resident) Consultants, Technicians (PhDs, Masters and B.Sc)	UDSM-Botany & Zoology Dept. also within & without the University	UDSM- Botany & Zoology Dept.	Taxonomic identification, teaching, research, consultancy.	Students, Researchers, consultants, private individuals	Consultancy, teaching, public lectures, Workshops, seminars, displays, visits, field days, special references
	Scientists/researchers	Various (within &	SUA (Faculty of	Teaching,	Students, Researchers,	Consultancy, teaching,

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	hers (visiting & resident) Consultants, Technicians (PhDs, Masters and B.Sc)	without SUA)	agriculture- Department of Crop Science and Production, forestry, veterinary medicine and Pest management centre)	research, consultancy, Taxonomic identification, technology transfers.	consultants, private individuals	public lectures, workshops, seminars, agriculture shows, training courses and specual reference
	Researchers in various ARIs	Various (within & without Tanzania)	ARIs	Research, consultancy, Taxonomic identification, technology transfers.	Farmers, Technical experts & policy makers.	Workshops, seminars, agriculture show displays, visits, field days, training courses & special references
Literature	Books guides, keys and maps	Locally made and abroad	TPRI, SUA, UDSM, ARIs, individual experts	Reference, Teaching, Research	Researchers, students, extension officers and farmers & Environmentalists	Libraries, Synchronised catalogues, special collections, agriculture show displays, visits, field days, training courses
Taxonomic equipment/facilities	Computers microscopes cameras field guides	Locally and abroad	TPRI National Herbarium	Taxonomic identification	Researchers extension officers and environmentalists	Training courses, special references, visits and seminars.
	Crop protection compendium	CABI, UK	SUA	Keys for identification and general pest information	Researchers, lecturers, students	CD ROM
	Taxonomy of the Dacina	Natural History Museum, UK	SUA	To be used for identification	Researchers, lecturers and students	CD ROM

				of fruit flies of genera Dacus and Bactrocera		
	Fruit fly identification system and systematic information database	Leiden, Netherlands	SUA	Identification and classification of fruit flies	Researchers, lecturers and students	Book/ CD ROM
	SAFRINET CD		SUA	An aid to collection and preservation of insects and arachnids	Researchers, students, lecturers	CD ROM
	Digital cameras	Imported (various)	SUA	For taking images of organisms	Researchers	N/A
	Global Positioning Systems (GPS)	Garmin	SUA	For taking the coordinates of a location	Researchers	N/A
	Sweep nets	Imported from Belgium	SUA	For collecting insects	Researchers, lecturers and students	N/A
	Insects collection boxes	Imported from Europe	SUA	For preserving the insects	Researchers, lecturers and students	N/A
	Microscopes	Abroad (various)	SUA	For observing insects	Researchers, lecturers and students	N/A
	Traps (various)	Imported (various)	SUA	For collection of insects	Researchers	N/A
	Pruning shears	Imported (various)	SUA	For sampling plant parts	Researchers, lecturers and students	N/A
	Weed presses	Locally made	SUA	For pressing	Students	N/A

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				sampled plants		
Institutions/stakeholders/collaborators and partnerships	Networking and partnership schemes	Through researchers at Universities, Research Institutions	Universities & Research Institutions	To enhance and facilitate understanding of existing pests and share knowledge among researchers	Researchers, Academicians, private agencies & policy makers	Seminars, workshops, consultation visits, web discussion, shows etc.
	Fruit fly identification system and systematic information database	Leiden, Netherlands	SUA	Identification and classification of fruit flies	Researchers, lecturers and students	Book/ CD ROM
	Fruit flies of economic importance: Their bionomics	CABI, UK	SUA	Identification, distribution and management of fruit flies	Researchers, lecturers and students	Book
Pests						
Flora	Herbarium of identified and pressed weed specimen.	National herbarium of Tanzania	TPRI	Taxonomic identification of weeds	Researchers, academicians, extension officers, farmers.	Training workshops, exhibition, advisory visits, seminars etc
	Herbarium of identified and pressed specimen, seeds and logs	UDSM-Botany Department	UDSM-Botany Department	Training, References, researches and conservation	Students, Researchers, Academicians, individuals and policy makers	Training, workshops, consultancy, networking with partner institutes and NGOs, orientation visits by policy makers
	Tree Seed collections for planting and reference/conservation	Trees seeds collected throughout Tanzania from local & exotic spp	TTSA cabinets and cold rooms	Selling to customers interested in tree planting, Reference and	Anybody interested in tree planting, Researchers, botanists, policy makers	Meetings, seminars, workshops training and scientific visit.

				Taxonomic identification of trees, teaching.		
	Identified and pressed weed specimens	Uyole Research institute	ARI Uyole Research laboratory	To gain knowledge and enhance IPM promotion in weeds	Researchers, Extension agents, farmers, private agents, students, policy makers	Workshops, seminars, agriculture show displays, visits, field days, training courses, special references
	Identified and pressed weed specimens	Weed science laboratory at SUA	SUA	Training, reference and research	Academicians, Researchers, students, private agents & experts	Lectures, Practical training, seminars etc.
	Botanical garden	Faculty of forestry-SUA	SUA	Training, reference and research	Academicians, Researchers, students, private agents & experts	Lectures, Practical training, seminars, field practical, excursions etc.
Fauna (Invertebrates vertebrates)	Collection of Identified and preserved specimen (insects, birds and Rodents)	TPRI Laboratories	TPRI	Taxonomic references, Pest management & training on IPM, regulation and quarantine	Researchers, visiting experts, students, extension officers and farmers.	Meetings, seminars, workshops, training and scientific visits.
	Collection of various insect pests and marine arthropods	Entomology laboratory at DCSP- SUA	SUA	Training, References, researches	Academicians, students, researchers and consultants	Lectures, Practical training, seminars etc.
	Collection of fruit flies spp	SUA/ Royal Museum for Central Africa (Tervuren, Belgium)	SUA	Reference and identification	Academicians, students, researchers and consultants	Lectures, Practical training, seminars etc.
	Collection of destructive insects of three plants	Entomologist and botanists/foresters at TTSA	TTSA laboratory at the headquarters in Morogoro	Reference and Taxonomic identification of tree pests, teaching, guide	Foresters/ botanists, researchers field workers, students, partners in tree production	Consultancy, Meetings, seminars, workshops training and scientific visits, brochures, shows (nanenane &

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				to extension officers		sabasaba), customer outreach programs.
	Localized collections of insects usually based on individual projects objectives	Researchers/scientists at UDSM in collaboration with foreign experts and local institutions such as SUA	UDSM-Zoology Department	Training, References, researches and conservation	Students, Researchers, Academicians, individuals and policy makers	Training, workshops, consultancy, networking with partner institutes and NGOs, orientation visits by policy makers
	Collection of whitefly spp, sweetpotato weevils and cotton pests	Roots & tubers and Cotton programs at ARI-Ukiliguru	ARI-Ukiliguru	References, researches and extension services	Researchers, extension officers, students and farmers	Training, workshops, consultancy and NGOs, orientation visits by policy makers
Databases	Computer hardware and software	TPRI	TPRI collection reference centre	Reference and Taxonomic identification of trees, teaching.	Researchers, extension officers and farmers.	Meetings, seminars, workshops training and scientific visit.
	A database of fruit flies of Morogoro	SUA	SUA	Reference information on fruitfly description, distribution & host range	Researchers, lecturers and students	CD ROM
	Flora (LEAP), Tree catalogue, TROPICOS & electronic data base	Experts at UDSM-Botany department in collaboration with foreign experts	UDSM-Botany Dept.	Training, Reference & Research	Students, Researchers, Academicians, individuals and policy makers	Meetings, seminars, workshops training and scientific visit.
	Flora (LEAP), Tree catalogue, TROPICOS & electronic data base	Consultant taxonomists, Foresters and Botanists at TTSA	TTSA	Reference, conservation, training.	Environmentalist, foresters, researchers, Students, policy makers	Workshops, Shows, leaflets/brochures, short courses, seminars
Human resources	Post graduate	Locally and abroad	TPRI	Research,	Researchers, extension	Meetings, seminars,

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	taxonomist & Para taxonomist			consultancy and training.	officers and farmers.	workshops training and scientific visit
	Scientists/researchers (visiting & resident) Consultants, Technicians (PhDs, Masters and B.Sc)	UDSM-Botany & Zoology Dept. also within & without the University	UDSM- Botany & Zoology Dept.	Training & taxonomic identification, research, consultancy	Students, Researchers, consultants, private individuals	Consultancy, teaching, public lectures, Workshops, seminars, visits, field days, references
	Scientists/researchers (visiting & resident) Consultants, Technicians (PhDs, Masters and B.Sc)	Various (within & without SUA)	SUA (Faculty of agriculture- Department of Crop Science and Production, forestry, veterinary medicine and Pest management centre)	Teaching, research, consultancy, Taxonomic identification, technology transfers.	Students, Researchers, consultants, private individuals	Consultancy, teaching, public lectures, workshops, seminars, agriculture shows, training courses and special reference
	Researchers in various ARIs	Various (within & without Tanzania)	ARIs	Research, consultancy, Taxonomic identification, technology transfers.	Farmers, technical experts & policy makers.	Workshops, seminars, agriculture show displays, visits, field days, training courses, special references
Literature	Books, keys, guide, maps (hard & electronic form)	Locally and abroad	TPRI, SUA, UDSM, ARIs, individual experts	Reference, Research, training & consultancy.	Researchers, students, extension officers and farmers & Environmentalists	Libraries, Synchronised catalogues, special collections, agriculture show displays, visits, field days, training courses
	Management of selected crop	SUA	SUA	Identification and	Researchers, lecturers and students	Book

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	pests in Tanzania			management of crop pests		
	Field guide to insects of South Africa	South Africa	SUA	Quick identification of insects	Researchers, lecturers and students	Book
	Agricultural insect pests of the tropics and their control	Longman, UK	SUA	Identification and management of agricultural pests	Researchers, lecturers and students	Book
	Entomology and pest management		SUA	Identification and management of insect pests	Researchers, lecturers and students	Book
	Agricultural entomology	Timber Press, USA	SUA	Identification and management of agricultural pests	Researchers, lecturers and students	Book
	Entomology and pest management		SUA	Identification and management of insect pests	Researchers, lecturers and students	Book
	Agricultural entomology	Timber Press, USA	SUA	Identification and management of agricultural pests	Researchers, lecturers and students	Book
Taxonomic equipment	Computers, microscopes, and cameras	Locally	TPRI, SUA, UDSM, ARIs, individual experts	Reference, Research, training & consultancy.	Researchers & students & academician	Lectures, Libraries, Synchronised catalogues, special collections
Institutional/Stakeholders/Collaborations	Networking and partnership schemes	Through researchers at Universities,	Universities & Research Institutions	To enhance and facilitate understanding	Researchers, Academicians, private agencies & policy	Seminars, workshops, consultation visits, web discussion, shows etc.

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		Research Institutions		of existing pests and share knowledge among researchers	makers	
Pollinators						
Bees, butterflies/moth birds, bats rodents human being	Preserved specimens of identified bees and butterflies	Reference collection for Insect, rodent and birds in Labs at TPRI, SUA, UDSM, Zanzibar	TPRI, SUA, UDSM, Zanzibar (Jozani)	Reference for Identification, teaching and consultation.	Researchers, students, visiting experts, extension officers and farmers.	Lectures, seminars, consultancy, training workshops and scientific visit.
Database (Computer hardware and software)	Birds, bees, butterflies, moths, rodents specimens and guides	TPRI, DCSP-SUA, UDSM, Zanzibar	TPRI, SUA, UDSM, Zanzibar (Jozani)	Taxonomic identification	Researchers, students, extension officers and farmers.	Lectures, Meetings, seminars, workshops training and scientific visit.
Human resources	Taxonomists and par taxonomists (PhDs, Masters, B.Sc & Diplomas)	Locally and abroad	TPRI, SUA, UDSM, ARIs, TTSA, Zanzibar	Taxonomic identification, training, extension services & consultancy	Researchers, academicians, students, extension officers and farmers.	Lecturing, Consultancy, seminars, workshops training and scientific visit.
Literature	Books, keys, guides and maps	Locally and abroad	TPRI, SUA, UDSM, ARIs, TTSA, Zanzibar	Taxonomic identification, teaching, consultancy.	Academician, Researchers, extension officers and farmers.	Lecturing, Consultancy, seminars, workshops training and scientific visit.
Taxonomic equipment	Computers, microscopes, cameras	Locally and abroad	TPRI, SUA, UDSM, ARIs, TTSA, Zanzibar	Teaching, Practical demos, Taxonomic identification	Researchers, extension officers and farmers.	Meetings, seminars, workshops training and scientific visit.
Human resources	Taxonomists and para taxonomists	Locally and abroad	TPRI, SUA, UDSM, ARIs,	Teaching, Practical	Researchers, extension officers and farmers.	Meetings, seminars, workshops training and

			TTSA, Zanzibar	demos, Taxonomic identification		scientific visit.
Institutional/stakeholder/collaboration and partnership	Networking and partnership schemes	Through researchers at Universities, Research Institutions	Universities & Research Institutions, TTSA, Zanzibar	Enhance and facilitate understanding of existing pests and share knowledge among researchers	Researchers, Academicians, private agencies & policy makers	Seminars, workshops, consultation visits, web discussion, shows etc.

Existing tools and products could also include:

1. Collections
2. Information
 - (i) Databases and literature
3. Specialists (NB.Experts are also end users)

Information about species

- a. Libraries of major taxonomic institution
- b. Databases. databases could about information sources e.g. of funders of taxonomic projects, etc

Tools and facilities

- a. Tailor-made software for members

End users of taxonomic tools or target audience

- a. Conservation and resource managers
- b. Environment protection agencies
- c. Also will focus according to man and biosphere
- d. List all others encountered during the consultancy

2.2: Existing Tools and products

Category	Stakeholder	Desired tools
IAS		
Herbaria (collections & hard copy catalogues)	TPRI, UDSM, SUA, TTSA, ARIs, International partners, Students, Private agents, Policy makers	Digital technology (Electronic herbaria in websites)
Fauna collections (insects, birds and rodents)	TPRI, UDSM, SUA, TTSA, ARIs, International partners, Students, Private agents, Policy makers	Digital technology (Electronic collections in websites)
Flora & Fauna taxonomic keys	TPRI, UDSM, SUA, TTSA, ARIs, TACRI International partners NGOs, Students, Private agents, Policy makers	Electronic identification software (digital), molecular technology, ID cards, pictorial keys, reference collections (in websites)
Taxonomic equipment (Computers, microscopes and cameras).	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Digital technology, Molecular facilities
Database (computer hardware and software)	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Modern computer hardware and up to date software/programs to facilitate taxonomic activities, eg. CABI catalogues, TROPICOS etc.
Literature (books, journals, guides, maps, posters, brochures, leaflets, keys and papers)	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Ultra-modern library facilities, up to date species lists, field guides, laminated photos

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Human resources (Taxonomists and par taxonomists)	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Well-trained taxonomists, experienced researchers
Institutional/stakeholder/ collaboration and partnership	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI, Farmers, Environmentalists.	Well established networks through professional bodies, websites, etc.
Pests		
Herbaria (collections & hard copy catalogues)	TPRI, UDSM, SUA, TTSA, ARIs, International partners, Students, Private agents, Policy makers	Digital technology (Electronic herbaria in websites)
Fauna collections (insects, birds and rodents)	TPRI, UDSM, SUA, TTSA, ARIs, TACRI, International partners, Students, Private agents, Policy makers	Digital technology (Electronic collections in websites)
Flora & Fauna taxonomic keys	TPRI, UDSM, SUA, TTSA, ARIs, TACRI, International partners NGOs, Students, Private agents, Policy makers	Electronic identification software (digital), molecular technology, ID cards, pictorial keys, reference collections (in websites)
Taxonomic equipment (Computers, microscopes and cameras).	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Digital technology, Molecular facilities
Database (computer hardware and software)	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Modern computer hardware and up to date software/programs to facilitate taxonomic activities, eg. CABI catalogues, TROPICOS etc.
Literature (books, journals, guides, maps, posters, brochures,	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Ultra-modern library facilities, up to date species lists, field guides, laminated photos

leaflets, keys and papers)		
Human resources (Taxonomists and par taxonomists)	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI.	Well-trained taxonomists, experienced researchers
Institutional/stakeholder/ collaboration and partnership	TPRI, UDSM, SUA, TTSA, ARIs, International partners NGOs, Private agents, Policy makers, TAFORI, Ministry of Agriculture, TAWIRI, Farmers, Environmentalists.	Well established networks through professional bodies, websites, etc.
Pollinators		
Fauna collections (insects, birds and rodents)	TPRI, UDSM, SUA, TAWIRI, ARIs, TACRI, Zanzibar, International partners, Students, Private agents, Policy makers.	Digital technology (electronic collections in websites)
Fauna taxonomic keys	TPRI, UDSM, SUA, TAWIRI, ARIs, TACRI, Zanzibar, International partners NGOs, Students, Private agents, Policy makers	Electronic identification software (digital), molecular technology, ID cards, pictorial keys, reference collections (in websites)
Taxonomic equipment (Computers, microscopes and cameras).	TPRI, UDSM, SUA, ARIs, TAWIRI, Zanzibar, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture.	Digital technology, Molecular facilities
Database (computer hardware and software)	TPRI, UDSM, SUA, ARIs, TAWIRI, Zanzibar, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture.	Modern computer hardware and up to date software/programs to facilitate taxonomic activities, eg. CABI catalogues.
Literature (books, journals, guides, maps, posters, brochures,	TPRI, UDSM, SUA, ARIs, TAWIRI, Zanzibar, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of	Ultra-modern library facilities, up-to-date species lists, field guides, laminated photos

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leaflets, keys and papers)	Agriculture,	
Human resources (Taxonomists and par taxonomists)	TPRI, UDSM, SUA, ARIs, TAWIRI, Zanzibar, International partners NGOs, Students, Private agents, Policy makers, TAFORI, Ministry of Agriculture.	Well-trained taxonomists/systematists, experienced researchers
Institutional/stakeholder/ collaboration and partnership	TPRI, UDSM, SUA, TAWIRI, TAFORI, ARIs, Zanzibar, International partners NGOs, Private agents, Policy makers, Ministry of Agriculture, Farmers, Environmentalists.	Well established networks through professional bodies, websites, etc.

3. Target users (Stakeholder Analysis)

(Stakeholder matrix) in each case spell out the name of the stakeholder, the taxonomic tools and products produced to enhance food security, ecosystem services, trade, agricultural productivity and ultimately human well being, environmental integrity and sustainability. Please fill-in the following table: Make sure the information given covers the whole country. Address

Name of Strategic Stakeholder Institution (Govt institutions, Statutory agencies, Research institutions, Teaching and Training, International Organizations, National NGOs, Private companies, Community based organizations, etc)	Roles Of the stakeholder	Mandates Of the stakeholder	Tools and or Products produced (e.g. Species lists, Identification tools, Ecological information, Educational information, Species distributional information, etc)	Status Of the tools & products	ISSUES Description of problems encountered; Issues that need to be addressed; Decisions / Actions that can be taken
University of DSM (Botany and Zoology Dept)	Teaching/Training, research, consultancy, Advisory.	Teaching, research, consultancy	Herbaria, Insects collections, floras, pictorial keys	Fairly well-organised but needs some improvements.	Some are bulky, deteriorating and not well characterised. They need to be converted into electronic forms.
SUA (faculty of Agriculture-DCSP & Forestry)	Teaching/Training, research, consultancy, Advisory, conservation, extension services, Landscaping.	Teaching, research, consultancy	Herbaria, collections (insects, birds and rodents), catalogue, floras, pictorial keys, posters, field guides, leaflets, maps	Well-organised but needs some improvements.	Some tools & products need to be converted into electronic forms. Harnessing of all the available but fragmented tools & products into a collective reference.
TPRI	Research, product identification, certification, conservation, training, advisory and extension services.	Research and technical services	Herbaria, collections (insects, birds and rodents), catalogue, floras, pictorial keys, posters, field guides, leaflets, maps	Some well-organised but a few needs some improvements.	Some tools & products need to be converted into electronic forms. Collections need improved storage cabinets.
ARIs	Research, training & extension services	Research	Insects collections, pictorial keys, posters, field guides & leaflets	A few are well-organised but most of them are fragmented, species/commodity	Collections need appropriate labelling, updated taxonomic identity improved storage cabinets,

				specific not up to standard and need improvements.	pictorials IDs and extension material be in understandable language.
TTSA	Conservation, Landscaping, training, research, consultancy, extension services.	Conservation & environmental protection	Herbaria, Insects collections, floras, pictorial keys, brochures, leaflets	Very well-organised but localised	Needs expansion of services through Zonal centres and outreach programs/centres.
TAWIRI	Research on Wildlife, advisory services, conservation & training	Wildlife research & management	Pollinators' collections, Herbarium, floras, pictorial keys, maps, brochures.	well-organised but localised	The collection needs to be converted in electronic forms and made available through websites
TACRI	Training, research, extension services.	Coffee Research	Collection insect pests of coffee & grown coffee clones.	Fairly well organised but localized	The insect collection has been neglected and not taken care of. It requires attention & modern storage cabinets
NGOs, private companies and other organizations	Support research, outreach programs, collaboration & Community support (farmers)	Support collaboration in research & Community outreach programs,	Technologies dissemination tools and products (leaflets, brochures, ID keys, maps, posters and leaflets)	A few are fairly well kept and up to standard but most of them needs improvement	Some published leaflets, brochures, posters and training materials needs to be reviewed in terms of quality, contents and language. A few needs updating.

4. Dissemination for existing products and tools

CATEGORY	Name List all means of disseminating tools & products you have come across in your country	Successes	Failures	Challenges
IAS				
	Lectures, supervision of students, meeting, seminars, workshops, training, exhibition, consultancy, websites links, Tv & Radio programs and Newspapers	High to moderate depending on the efficiency of the support systems such as funding, convenience and accessibility of the products and tool.	Localized collection, Limited coverage of the mass media in rural areas	Inadequate support systems, poor communication networks, limited power supply, language barriers, limited funding and limited vigilances.
Pests				
	Lectures, supervision of students, meeting, seminars, workshops, training, exhibition, consultancy, websites links, Tv & Radio programs and Newspapers	High to moderate depending on the efficiency of the support systems such as funding, convenience and accessibility of the products and tool.	Poor communication in rural areas Localized collection, Limited coverage of the mass media in rural areas	Inadequate support systems, poor communication networks, limited power supply, language barriers, limited funding and limited vigilances.
Pollinators	Lectures, supervision of students, meeting, seminars, workshops, training, exhibition, consultancy, Tv & Radio	Moderate: depends on the efficiency of the support systems such as funding,	Poor communication in rural areas Localized collection, Limited coverage of the	Inadequate support systems, poor communication networks, limited power

	programs and Newspapers	convenience and accessibility of the products and tool.	mass media in rural areas	supply, language barriers, limited funding and limited vigilances.
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5. Recommendation of new tools & products

CATEGORY	Name List all new tools & products you have come across elsewhere good for your country not listed above	What for potential applications	Where Where best to develop it	Target Group/stakeholder	Recommendation how to disseminate
AIS					
	Digital taxonomic systems, pictorial keys and molecular characterization facilities	Identification of new species that and not common, genetic characterization of the new and common species that are difficult to identify	Universities, Research institutions, and international centres of excellencies such as CGIARs.	Academicians, researchers teaching staffs, students, farmers, private partners and industries.	Through universities and Research Institutions
Pests	Digital taxonomic systems, pictorial keys and molecular characterization facilities	Identification of new species that and not common, genetic characterization of the new and common species that are difficult to identify	Universities, Research institutions, and international centres of excellencies such as CGIARs.	Academicians, researchers teaching staffs, students, farmers, private partners and industries.	Through universities and Research Institutions
Pollinators	Digital taxonomic systems, pictorial keys and molecular characterization facilities	Identification of new species that and not common, genetic characterization of the new and common species that are difficult to identify	Universities, Research institutions, and international centres of excellencies such as CGIARs.	Academicians, researchers teaching staffs, students, farmers, private partners and industries.	Through universities and Research Institutions

6. Suitability of all tools & products

CATEGORY	Name of the tool or product produced	Target audience	Suitability	Why? If unsuitable	Mitigation measures
IAS					
	Herbaria, collections, computers (hardware & software) microscopes, digital cameras, field guides, posters, keys, maps & books	Academicians, researchers, experts, students, training staffs, farmers, traders & industrial producers	Good reference materials although some needs improvement	N/A	Improve & translate the existing once to local language and affordable costs. Also the distribution channels be improved
Pests					
	Herbaria, collections, computers (hardware & software) microscopes, digital cameras, field guides, posters, keys, maps & books	Academicians, researchers, experts, students, training staffs, farmers, traders & industrial producers	Good reference materials although some needs improvement	N/A	Improve & translate the existing once to local language and affordable costs. Also the distribution channels be improved
Pollinators					
	Collections, computers (hardware & software) microscopes, digital cameras, field guides, posters, keys, maps & books	Academicians, researchers, experts, students, training staffs, farmers, traders & industrial producers	Good reference materials although some needs improvement	N/A	Improve & translate the existing once to local language and affordable costs. Also the distribution channels be improved

7. Infrastructure for tools and products

Current and potential infrastructure for developing these tools and products to identify the Niche for the UVIMA project (is the infrastructure such as software and imaging technologies robust enough or does UVIMA need to build on, enhance or otherwise, if so what information / training / software etc is need?) documented. (These may include Collections and Databases, Hardware, Software, Technologies, Communication resources, Secondary e.g. keys, literature, publications and tertiary, Expertise, Programmes, Projects and partnerships etc for each thematic area)

CATEGORY	Current &/Potential infrastructure for developing these tools and products	Gaps	Future plans
AIS	Collection facilities, printing and press facilities, plant presser/insect storage cabinets, assembling and processing industries, molecular facilities.	Some are old, poorly maintained & not operating	Establish modern laboratories, pressing, cartography, photographing and storage, processing and assembling facilities.
Pests	Collection facilities, printing and press facilities, plant presser/insect storage cabinets, assembling and processing industries, molecular facilities.	Some are old, poorly maintained & not operating. Some molecular facilities available in ARIs but not utilized because of lack of technical expertise	Establish modern laboratories pressing, cartography, photographing and storage, processing and assembling facilities.
Pollinators	Collection facilities, processing and storage cabinets & molecular facilities.	Some are poorly maintained. Molecular facilities & expertise are lacking	Establishing modern laboratories and processing and storage facilities

8. Existing communication strategies and dissemination channels for tools & products

CATEGORY	Name	Institution	CONTACTS
	List all strategies and channels you have come across in your country)	List the all institutions in your country where these are	Give contact details of the Institution and focal person

		located	
AIS	Lectures, Consultancy, Networks (TEA, EAFRINET), Professional bodies (Wildlife society of Tanzania), Partnerships, collaborative researches, meeting, seminars, workshops, training, hardware linking Tv & Radio programs and Newspapers	SUA, UDSM, TPRI, TAWIRI, TAFORI, TTSA, ARIIs	<p>SUA - Dr. Rwegasira Gratian M. Dept of Crop Science and Production, Box 3005, Chuo Kikuu, Morogoro. Grwegasira@suanet.ac.tz / grwegasira@cgiar.org</p> <p>TPRI - Dr. Afihini S. Ijani, TPRI, Box 3024 Arusha, Tanzania. asmijani@yahoo.com</p>
Pests	Lectures, Consultancy, Networks (TEA, EAFRINET), Professional bodies (Wildlife society of Tanzania), Partnerships, collaborative researches, meeting, seminars, workshops, training, hardware linking Tv & Radio programs and Newspapers	SUA, UDSM, TPRI, TAWIRI, TAFORI, TTSA, ARIIs	<p>SUA- Dr. Mwatawala Maulid, Dept of Crop Science and Production Box 3005, Chuo Kikuu, Morogoro. mwatawala@suanet.ac.tz</p> <p>TPRI - Mr. Lyatuu Hendry, TPRI, Box 3024 Arusha, Tanzania. hendrylyatuu@yahoo.co.uk</p>
Pollinators	Lectures, Consultancy, Networks (TEA, EAFRINET), Professional bodies (Wildlife society of Tanzania), Partnerships, collaborative researches, meeting, seminars, workshops, training, hardware linking Tv & Radio programs and Newspapers	SUA, UDSM, TPRI, TAWIRI, TAFORI, ARIIs	<p>WIOMSA- Dr. Osore Melckezedeck, Box 3298, Mizingani St, Zanzibar msore@wiomsa.org</p>

9. Defining specific challenges, constraints, key gaps and opportunities for UVIMA

#	Issue/Category	Specific challenges	Constraints	Key gaps	Opportunities	Proposed
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						Solution
	Herbaria and fauna collections	To maintain in the same form for long period. Fragmented collections, duplication of tasks.	Inadequate resources, technical personnel, limited funding, limited networking.	Outdated facilities, inadequate materials & skilled personnel	UVIMA to facilitate acquisition of modern facilities and facilitate training of personnel	Explore for source of funding. Develop technologies that are robust and affordable
	Database	Limited linkages and collaboration among institutions & experts.	Limited funding, few professional bodies, isolated/fragmented research work	Limited outreach and collaboration (Few institution in the thematic areas)	UVIMA to facilitate networking and linkages	Develop a network for key stakeholders and partners
	Literature	To provide adequate & up-to-date literature to various stakeholders	Inadequate, some not easily accessible to stakeholders	Few or outdated literatures are available different institutions	UVIMA scientists to enrich thematic taxonomists	Establish reliable sources of literature and web-linkages to international libraries
	Taxonomic equipment	Inadequate and outdated facilities and lack of modern laboratories	Inadequate funding, limited awareness of technological advancements, limited commitment of the Tanzanian Government on research facilities	Very few modern facilities, most of existing facilities are outdated, some are non-existent	UVIMA to improve on the existing facilities and establish new modern facilities	UVIMA to provide funds for purchase of the modern facilities
	Human resources	Few skilled personnel & limited exposure to modern technologies	Lack of funding & opportunities for further training, lack of	Very few well-trained personnel (taxonomists/	UVIMA to improve on the skills of the	UVIMA to assist in new and further

			government commitment	scientists)	personnel	training of personnel
	Institutional/Stakeholder collaboration and partnership	Limited linkages and collaboration among institutions, fragmentation of activities due to poor communication	Inadequate linkages, few professional bodies, poor coordination of research work/activities among the stakeholders	Few formal forum linking stakeholders	Initiation of professional bodies, linkage networks and national forum	UVIMA to establish forums for stakeholders to enhance collaboration

10. Checklist of persons in the country with knowledge in Taxonomy including (Pollinators, Pests and IAS)

Please provide updated list of Taxonomists in your thematic area (list the UVIMA members and specialists first): Prepare this in an Excel file as well.

Please provide updated list of Taxonomists in your field (list the UVIMA members and specialists first): Prepare this in an Excel file

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Name	Title (Profession)	qualification	Specialization	Institution	Contact Address	Phone- Mobile	Email
Mwatawala Maulid	Lecturer (Entomologist)	PhD	Agricultural entomology	SUA	Box 3005 Chuo Kikuu, Morogoro	+255787 087870	mwatawala@suanet.ac.tz
Afihini Ijani	Researcher (Plant protection)	PhD	Nematology	TPRI	Box 3024, Arusha	+255 754 365606	asmijani@yahoo.com
Graton M. Rwegasira	Lecturer (entomology)	PhD	Vector entomologist /virologist	SUA	Box 3005 Chuo Kikuu, Morogoro	+255 754 595058	grwegasira@suanet.ac.tz /grwegasira@yahoo.co.uk
Henry A. Lyatuu	Researcher	M.Sc.	Weed Scientist	TPRI	Box 3024, Arusha	+255 754 318232	Henrylyatuu@yahoo.co.uk
Juma Lossini	Researchers	M.Sc.	Agric. entomologist	TPRI	Box 3024, Arusha	+255 754 311720	jalossini@yahoo.com
Eliaineny Minja	Resracher	PhD	Entomologist	Private	Box 2409	+255 787034057	eliaineminja@yahoo.co.uk
Dr. Melckzedek Osore	Taxonomy	PhD in marine science	Marine taxonomist	WIOMSA			mosore@wiomsa.org
Yussuf H. Kombo	Environmental Forestry	M.Sc in Environmental Forest	Ethnobotany	DCCFF	P. O. Box 3526, Zanzibar	0713459447	yhkombo@yahoo.com
Vuai Lada	Plant Pathology	M.Sc in plant pathology	Crop pest	ASSP	The Ministry of Agriculture, livestock and Environment, P. O. Box 3526, Zanzibar, Tanzania	0777436503	kilimo@zanlink.com
Khatib					PADEP		
Zainab Salim	Plant Entomology	M.Sc in plant entomology	Plant entomology/ crops pest	Plant Protection Division	The Ministry of Agriculture, livestock and Environment,	0777432523	kilimo@zanlink.com

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					P. O. Box 159, Zanzibar, Tanzania		
Dr. Zakia	Plant pathology	PhD in plant pathology	Plant pathology	State University of Zanzibar	P. O. Box 754, Zanzibar	0784430994	
Mberik Rashid	Plant entomology	M.Sc Entomology	Plant Entomology	Ministry of Agriculture	P. O. Box 159, Zanzibar, Tanzania		

9. Related Projects

Please report on the status of projects whose objectives are more less similar to UVIMA Project in your country along the lines of your thematic area using the table below

Project Name	Implementing institution	Source of funding	Status (project beginning, mid-term, ending)	Focal person	Contact details
JRS – BGCI	National Herbarium of Tanzania (NHT)	BGCI	April 2008	E. Njau	
SECOSUD	NHT	Missour I Botanical Garden	Completed	John Elia	

ANNEXES

In each report, please include the following information in the annexes:

- ✓ General photographs/scanned copies illustrating the environment of the Tools & Products
- ✓ Soft copy of thematic reports where available or where they can be got from (institution and focal person)
- ✓ Hard copy of thematic reports where available or where they can be got from (institution and focal person)
- ✓ List and contact details of all persons met and referred to during the consultancy meeting (to build the UVIMA Dbase)

Annex 1: Inventory of Outputs/Services (fill in as appropriately as you can)

a) Consultancy meetings

No	Meeting Type	Title	Venue	Dates	Convened by	Organized by	# of Participants	Report issued as doc no	Language	Dated
1.										
2.										
3.										

b) Electronic & Printed Materials

No	Type	Title	Author(s)/Editor(s)	Publisher	Symbol	Publication Date	Where to get it and / or contact person
1.							
2.							
3.							