

FOREWORD

In the last decade of the 20th century NARO launched the Uganda Journal of Agricultural Sciences (UJAS). The journal was intended as one of the outlets for sharing erudite information on new developments in the agricultural and environmental sciences research sector with the various stakeholders. This goal was partially achieved. Over the years there has been increased investment in agricultural sector, however information and knowledge sharing has been asymmetrical due to sub-optimal publication of the journal. This is inconsistent with the national and regional strategic plans that aim at transforming the food and the agricultural sector by 2040 in the case of Uganda. It is against this backdrop in information sharing that this strategy has been developed. The strategy seeks to nurture the growth of UJAS into an effective and efficient medium for the management and dissemination of new scientific knowledge, information and innovations that is responsive to public and private sector demands for investments in the broader agricultural sector, whilst at the same time contributing to the global pool of knowledge.

The readership of the strategy includes but is not limited to students, researchers, extension, academia, policy makers, investors and entrepreneurs. It is my sincere hope that the strategy will meet your expectations and I invite you to read further and put it in action.

FOR GOD AND MY COUNTRY

Professor Joseph Obua
Chairman, NARO Governing Council

TABLE OF CONTENTS

| | |
|--|----|
| ACRONYMS | 3 |
| ACKNOWLEDGEMENTS | 4 |
| EXECUTIVE SUMMARY | 5 |
| | |
| 1 INTRODUCTION | 6 |
| 1.1 Role of Agricultural Sector in National Economic Development | 6 |
| 1.2 Importance of access to new Knowledge and Information in Agricultural Development | 6 |
| 1.3 Justification for the Strategy | 6 |
| 1.4 The Uganda Journal of Agricultural Sciences | 7 |
| | |
| 2 THE STRATEGIC PLANNING PROCESS | 9 |
| 2.1 The birth of UJAS Strategic Plan | 9 |
| 2.2 Development of the strategy | 9 |
| | |
| 3 OPPORTUNITIES AND CHALLENGES FACING DEVELOPMENT OF UJAS | 10 |
| 3.1 Opportunities | 10 |
| 3.2 Challenges | 11 |
| | |
| 4 THE UJAS STRATEGIC PLAN 2014 - 2023 | 14 |
| 4.1 UJAS Aspirations and Commitments | 14 |
| 4.2 Vision, Mission, Core Values and Strategic Principles | 14 |
| 4.3 Strategic Objectives | 15 |
| 4.4 Strategic Outputs | 16 |
| 4.5 Conceptual framework | 18 |
| 4.6 How to Achieve the Strategic Outputs | 18 |
| | |
| 5 STRATEGY MONITORING AND PERFORMANCE EVALUATION FRAMEWORK | 26 |
| | |
| 6 REFERENCES | 33 |

ACRONYMS

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| AJOL | African Journals Online |
| BIOSIS | Bio-Sciences Information Service of Biological Abstracts |
| BRICS | Brazil, Russia, India, China and South Africa |
| DSIP | Development Strategy and Investment Plan |
| GDP | Gross Domestic Product |
| GoU | Government of Uganda |
| HIV | Human-Immuno Virus |
| ICT | Information Communication Technology |
| MoEMD | Ministry of Energy and Mineral Development |
| MoH | Ministry of Health |
| NAR | National Agricultural Research |
| NARO | National Agricultural Research Organization |
| NARS | National Agricultural Research System |
| OA | Open Access |
| SMS | Short Message Service |
| STI | Science, Technology and Innovation |
| TF | Task Force |
| TPIS | Technology Promotion and Innovation Systems |
| UJAS | Uganda Journal of Agricultural Sciences |
| UMU | Uganda Martyrs University |

ACKNOWLEDGEMENTS

The development of this strategy was supported by NARO. The drafting team: Dr. Yona Baguma, Eng. Alphonse Candia, Dr. Andrew Kiggundu and Mr. Robert Anguzu are greatly acknowledged.

EXECUTIVE SUMMARY

During the UJAS Editorial Board meeting of 18th December 2012, it was noted that since inception in 1993, UJAS has remained in the “valley of death” in terms of flow of information and financial sustainability. This strategy seeks to nurture the growth of UJAS into an effective and efficient institution for the management and dissemination of new scientific knowledge, information and innovations that is responsive to public and private sector demands for investments in agricultural sector.

The broad goal of the strategy will be delivered through four principal strategic areas: creating an enabling environment, building competent technical capacity, ensuring sustainable funding and supporting application of knowledge and innovations for accelerated economic growth, prosperity and well being of Ugandans. The strategic areas will be achieved through strengthening relevant institutional and policy frameworks, improving governance and management systems for the journal, establishing editorial centre and publishing house, transiting UJAS into a departmental status supported by competent human resource. In addition, it will be imperative to secure adequate funding and broaden funding mechanisms. The journal will invest in building functional partnerships and networks for technical, leadership and marketing functions.

This strategy has been developed for 10 years (2014 – 2023) and its implementation is estimated to cost US \$ 2.5 million.

1 INTRODUCTION

1.1 Role of Agricultural Sector in National Economic Development

To foster economic growth in Uganda and contribute to the global knowledge, market and strategic investment in agricultural research, dissemination of information and innovations are vital for the transformation of agricultural sector and improvement of livelihoods. This is because the agricultural sector is fundamental in providing food, nutrition and income security. Although the sector's contribution to the total Gross Domestic Product (GDP) has declined over the last decade, it still provides 48% of exports; employment to approximately 75% of the population and livelihoods for approximately 70% of households. In addition, it provides a large proportion of the raw materials for industrial sector.

1.2 Importance of access to new Knowledge and Information in Agricultural Development

The agricultural sector growth declined from an average of 5.4% (1998-2002) to 1.5% between 2005 and 2012. A significant part of the reason for the dramatic decline was very limited access by stakeholders to new knowledge and innovations generated by research. The government intends to raise income per capita from US\$ 506 to 9,500; life expectancy from 51.5 to 85 years; and eradicate stunted syndrome in children under five from 33% to 0% by year 2040. With the huge 75% of the national population dependant on agriculture, transformation of the agriculture into a knowledge based sector of the economy is of paramount importance and urgency. Judicious application of new knowledge and innovation is critical for successful development of the entire agricultural sector including agro-processing industry. It is therefore imperative that guaranteed and sustained access to new knowledge and information generated through research is a must.

1.3 Justification for the Strategy

World over governments and development partners invest a lot of financial, intellectual, physical and institutional capitals in agricultural, environmental and medical sciences to generate public goods and services. The outputs of such investment are new knowledge and technologies that are useless unless transformed into innovations by the intended users. The first step for transformation of knowledge and technologies into innovations is the translation of the knowledge and technologies into information for communication; and implemented strategically to make desired impacts on stakeholders. Cognizant of the importance of Communication Strategies, some sectors have provided experiences that can guide other sectors of the economy. These include the Ministry of Health, which has demonstrated the need for intervention in specific communication strategies through the development and implementation of the Uganda Tuberculosis Communication Strategy (MoH 2008) and subsequently the National Communication Strategy for Nutrition and HIV (MoH, 2009). The Ministry of

Energy and Minerals Development has also developed the National Strategy on Oil and Gas (MoEMD, 2011). At highest level GoU launched an overarching Communication Strategy (GoU, 2013) as a means to achieving Vision 2040. This strategy compels all government agencies to effectively communicate and disseminate information and knowledge to the society. In addition, the Agricultural Research Policy 2003 and National Agricultural Research (NAR) Act 2005 require National Agricultural Research Organization (NARO) to establish a platform for information sharing and dissemination. Therefore NARO has developed its own Communication Strategy 2012, which states that Uganda Journal of Agricultural Sciences (UJAS) will be one of the main communication tools. Besides UJAS, there are currently five publishing outlets in the country. These outlets are: African Crop Science Journal; Social Development Journal from Uganda Martyrs University (UMU); Nkumba Business Journal; African Journal of Ecology and Makerere Medical Journal. It is only UJAS that responds adequately to the entire field of agricultural and environmental sciences. Thus, successful development of the journal will have far reaching impact on the Ugandan society and beyond than any of the other journals.

1.4 The Uganda Journal of Agricultural Sciences

The genesis of Uganda Journal of Agricultural Sciences dates back to early 1990's with the first issue published in December 1993. It was an initiative of Professor Joseph K. Mukiibi, the first Director General of NARO (1992 – 2003) and Editor-In-Chief of the journal. He noted that most of the Ugandan scientists could not afford publication fees levied on quality manuscripts submitted and accepted for publication in refereed journals in developed economies. In the event that such submissions were paid for and published, scientists and other stakeholders to whom the information is most relevant in Uganda cannot afford retrieve them for "home consumption". This therefore forced Professor Mukiibi to start UJAS. Even after the birth of the journal, the demand for agricultural information in the country has continued to increase necessitating the need to strengthen the journal (Rees *et. al.*, 2004).

Originally UJAS targeted the Ugandan audience with relevant information for the country. But currently, inspite of daunting challenge the journal has attracted manuscripts from scientists working in the various fields of agricultural and environmental sciences in Sub-Saharan Africa and beyond. The journal publishes original work in plant (crop and forestry), animal, fisheries, engineering, environmental, food and social sciences of relevance to agriculture. The journal also publishes short communications and research reports, original results warranting publications as full papers. It has a book review and advertisement sections. Thus the journal is indigenous, but international.

To date, the journal has published 15 volumes with peak performance between 1999 and 2003. During this time, NARO created good funding mechanisms for the journal with its own bank account, good management and the journal

gained a lot of popularity among scientists in the region. NARO and Makerere University have remained the major contributors to the journal.

From 2002 to 2005, NARO underwent a major institutional reform, which brought in other agricultural research services providers under one National Agricultural Research System (NARS). The new reconfiguration brought in new challenges as well as opportunities in scientific communication and information sharing. This necessitated a major transformation of UJAS in its editorial functions to rapidly respond to the reconfigured NARS and renewed need for high quality scientific publications. There is therefore a need for a comprehensive publishing framework to cope with the potential for increasing the contribution of the NARS to national and global knowledge resource inventory.

2 THE STRATEGIC PLANNING PROCESS

2.1 The birth of UJAS Strategic Plan

The notion of developing a 10-year (2014 – 2023) UJAS Strategic Plan was borne in the Editorial Board meeting of 18th December 2012. The Board noted that since inception in 1993, UJAS has not yet emerged from the “valley of death curve” in terms of financial sustainability and steady flow of information for dissemination. The meeting reaffirmed NARO’s desire to make UJAS the fulcrum for the dissemination and advancement of new scientific knowledge and innovations in the field of agricultural and environmental sciences in the country and beyond. The meeting also noted the need for a strategic plan to guide interventions that will see UJAS develop into a vibrant publishing house for the dissemination of scientific information and related services. The Board constituted a Task Force (TF) of eminent persons in NARO, with the overall terms of reference of developing a long term strategic plan for UJAS (UJAS Strategic Plan, 2014 – 2023) within one year.

2.2 Development of the strategy

To develop the strategy, the TF members held a series of meetings and workshops with stakeholders. The first workshop was predominantly a brainstorming session during which stakeholders built consensus on the UJAS Strategy as an intra-institutional, interventions specific tool for transforming UJAS into a competitive publishing house with a departmental status within NARO.

The TF members focused on identifying the critical challenges facing the journal that needed to be addressed, and opportunities that could be exploited to improve the national, regional and international visibility. Special attention was placed on developing the *journal Aspiration, Commitment, Vision, Mission and Core Values*. The stakeholders in these workshops included NARO Governing Council, NARO Management, Institute Directors, Local Universities, UJAS Editorial Board and eminent scientists in the NARS.

3 OPPORTUNITIES AND CHALLENGES FACING DEVELOPMENT OF UJAS

3.1 Opportunities

Some of the opportunities that UJAS will need to exploit are found in institutional and policy environment, and technical capacity.

3.1.1 Opportunities in the institutional and policy environment

Favourable policy and institutional frameworks for agricultural sector growth

Agriculture continues to play a critical role in Uganda's economic development. The Vision 2040, GoU envisages that investments in agriculture will increase the sector growth to 5.9% per annum and reduce the number of people below the poverty line to less than seven million (17.9% of the population) by 2015. Such investment plan has been translated in Development Strategy and Investment Plan (DSIP). The success of DSIP will depend in timely delivery of the requisite knowledge and information as an integral part of a national development process. This is because there is more demand for agricultural knowledge and information in Uganda compared to other countries in the region (Rees *et al.*, 2004). UJAS therefore has a great opportunity to position itself as a reliable source of knowledge and information for the agricultural sector development.

There are a number of other policies and institutional frameworks that enhance the demand for and the process of knowledge transfer. These include among others NARO communication strategy, which is directly linked to UJAS strategy; general infrastructural development including ICT, which facilitates knowledge transfer; agro-industrial development that creates the demand for knowledge and agricultural extension services. In addition the increasing participation of non-governmental organizations and the private sector in human skills development enhance the demand for knowledge. The private sector also has a unique role for providing a marketing channel for the journal, buying advertorial space and increasing the readership of the journal.

Publication of a wide range of Agricultural and Environmental Sciences

UJAS publishes research articles in the entire field of Agricultural and Environmental Sciences. This multi-disciplinary stature puts the journal at a good stage to compete favourably with other publishing houses in the world. These aspects of the journal articles broadens the utilization base of knowledge, making it "a one-stop centre" for participation in the intellectual market for agricultural, environmental and social sciences

3.1.2 Technical capacity opportunities

Increased number of scholars and researchers

The increased number of universities and research institutions in the country and beyond has resulted into ever increasing number of scholars and researchers

in the field of agricultural and environmental sciences. These scientists are looking for an efficient way to quickly publish their research results as well as access knowledge and information. UJAS can consequently position itself strategically to exploit this opportunity to capture and develop a sustainable and strong base of clientele out of the scholars and researchers.

Increased quest for innovations towards economic transformation

The dismal economic status of most developing countries in part is explained by the low scale of innovativeness. The BRICS countries (Brazil, Russia, India, China and South Africa) are rapidly leapfrogging their economies by adopting new technologies and home grown innovations. To realise this quest, most developing countries including Uganda have developed policies that promotes Science, Technology and Innovation (STI). UJAS can tap into the existing STI policy framework to make a significant contribution towards economic transformation of Uganda and beyond.

Existence of publishing platforms and journal clusters

There exists several publishing platforms/associations and journal clusters in the world. For instance, membership to African Journals on Line (AJOL), which is the world's largest collection of peer reviewed African published scholarly journals, will provide an opportunity for UJAS to be linked to over 500 other African Journals for improved access and visibility.

The advancement of Information Communication Technology

The advent of cheaper and faster internet connectivity gives UJAS tremendous opportunity to reach its stakeholders more efficiently than ever before.

NARO's position as a reputable organization

The National Agricultural Research Organisation is the apex body for guidance and coordination of all agricultural research activities in the national agricultural research system in Uganda. Since its establishment in 1992, the organization has built remarkable reputation as a solid scientific research institution both nationally and internationally. UJAS being a product of NARO, it leverages on this treasured reputation and accumulated experience in agricultural and environmental sciences research.

3.2 Challenges

Challenges facing the journal range from institutional, managerial, and technical to financial constraints. NARO and UJAS will need to address and or mitigate these challenges to enable the journal grow and be competitive in the publishing world. These challenges are listed below without any order of importance.

3.2.1 Institutional Challenges

NARO Functional Structure and Lean Budget

UJAS has a limitation which is imposed by the current NARO human resource establishment structure and lack of delineated administrative budget. These constraints manifest as increased burden on existing staff and competing for funds that are being allocated for other activities.

An ever-increasing level of competition from other journals world-wide

UJAS is operating in a landscape that is highly dynamic and rapidly evolving. Presently there are 459 African Journals on-line and thousands in the world with varying levels of regularity and popularity. Moreover, the publishing world is rapidly gaining sophistication with advances in ICT technologies. UJAS has not currently taken advantage of these sophistications, which presents a stiff competition for the journal.

Management of Intellectual Property Rights

Management of intellectual property and Copyright of articles published in UJAS is a joint responsibility of NARO and the author. However, NARO is still in the process of developing a functional Intellectual Property Right Policy framework. Once completed, the framework will increase on the attractiveness of the journal and interests of the wider stakeholders to publish with the journal.

3.2.2 Governance and Managerial Challenges

A functional Editorial Board

The governance and management of UJAS is a primary responsibility of NARO, but a delegated function to the Editorial Board of the journal. The current UJAS Editorial Board is constrained by imbalances in disciplines and regional institutional representation, as well as policy guidance. Other glaring constraints include low level of commitment by some board members, over-extended function of the editorial board and lack of departmental status.

Profiling UJAS's image in the broader public

At the moment UJAS has very limited publicity among the targeted stakeholders and general public. This underwrites the noble purpose of disseminating the generated information but also curtails the effective conversion of the knowledge and innovations into usable products that benefits the society.

Limited journal products

Presently, UJAS is identified by a single product - the journal, which has limited its clientele to scientists. In comparison, other journals elsewhere have a range

of products under the auspices of journal society. These include scientific events (conferences, symposia, meetings, etc), the journal publication and proof reading services.

3.2.3 Technical challenges

Wide base of reliable quality scientific peer reviewers

UJAS publishes multi-disciplinary articles which demand a wider expertise of reviewers to provide the desired high quality of the journal. At present UJAS is faced with reluctance of the identified reviewers to accept and/or comply with deadlines of reviewing manuscripts for publication in the journal. This contributes to delays in publishing and often compromised quality of the journal. The reluctance of the reviewers is attributed mainly to low visibility of the journal and lack of tangible and intangible incentives for the reviewers.

3.2.4 Financial Challenges

Adequate and sustainable funding

UJAS has the challenge of insufficient funding for its development and operational needs. This in part has been a result of overdependence on scarce resources from NARO. Until now, UJAS has operated without a committed budget line. Consequently it has tended to rely on the support sourced from other NARO's planned activities.

3.2.5 Cross-cutting Challenges

Perceptions of its prospective clients

UJAS is presently facing the challenge of accumulated negative attitude by the prospective clients towards the journal credibility. As a result many of the local scientists are reluctant to publish with the journal. The negative attitude towards the journal has been caused mainly by the low level of awareness on the journal among the scientists, delayed production of the journal and the low opinion towards the local journals.

4 THE UJAS STRATEGIC PLAN 2014 – 2023

4.1 UJAS Aspirations and Commitments

The principal aspiration of UJAS is to become one of the major hubs in Africa for disseminating and advancing new knowledge and innovations in all fields of agricultural and environmental sciences. This will be achieved by targeting a broader clientele, and timely publication of high quality scientific publication, which competes favourably in the international knowledge market. This entails establishing a competent Editorial Board, publishing house and journal office; attracting quality scientific manuscripts with high intellectual appeal; and establishing effective market intelligence for knowledge and innovations. It is envisaged that within the next ten years, UJAS will have shifted from its present state of marginal impact factor to a highly competitive journal with impact factor of at least two (how many times the journal is cited).

4.2 Vision, Mission, Core Values and Strategic Principles

The Vision Statement of UJAS has been crafted to depict what UJAS would like to be in the next ten years and beyond. The Mission Statement of UJAS defines the reason for its existence and expresses the central purpose of the journal around which it orientates all the activities. The Values of UJAS are guiding principles that the journal holds in high esteem. These principles form the Strategic Plan.

4.2.1 Vision

A highly competitive platform for sharing scientific knowledge, information and innovations in Agricultural, Environmental and Social Sciences

4.2.2 Mission

Nurture and support growth of UJAS into an effective and efficient institution for the management and dissemination of scientific knowledge, information and innovations, that is responsive to public and private sector demands for investments in agricultural sector development at national, regional, and international levels.

4.2.3 Core Values

Accountability: Timely response to stakeholders while upholding transparency, integrity and moral values.

Quality Science: Committing to the highest ethical standards for all parties involved in the act of publishing.

Robustness and flexibility: Analysing technological changes and tapping into new opportunities to accelerate and sustain publication of the journal.

Partnership: Fostering joint intellectual efforts in publishing and maximizing synergies to increase efficiency and impact of the journal.

Diversity: Creating publishing options and products to encourage typological stakeholder participation.

Timeliness: Ensuring timely peer reviews and publishing of articles online and or in print.

4.2.4 Strategic Principles

- a) Targeting critical issues that impede publishing including: Improving image of the journal; promoting writing culture among national scientists, and enhancing market penetration.
- b) Attracting and retaining unique talents and infrastructure resources for effective and efficient management and dissemination information; and quality assurance of journal publications.
- c) Establishing institutional arrangement for management of the journal as a departmental body responsible for the planning; implementing; financing monitoring and evaluation of the journal.
- d) Building partnerships with other publishing houses to encourage sharing of human, physical and intellectual capitals for increased efficiency of operations of UJAS.

4.3 Strategic Objectives

The Strategic Objectives have been formulated to attain UJAS aspirations and commitments. The objectives focus on addressing the observed challenges impeding the development of UJAS. They also aim at exploiting opportunities that contribute to developing UJAS to a reputable hub for disseminating and advancing new knowledge and innovations in agricultural and environmental sciences in Sub-Saharan Africa.

Strategic Objective 1: To create and explore an enabling environment for enhanced performance of the journal

Conducive working environment is one of the key factors that ensure good success of any entity. This objective is therefore to create an enabling working atmosphere for enhancing the overall performance of the journal. It aims at addressing issues in five broad areas described in specific objectives 1.1 to 1.5:

Specific Objective 1.1 Institutional and policy framework

Specific Objective 1.2 Governance and management of UJAS

Specific Objective 1.3 Editorial centre and publishing house

Specific Objective 1.4 Commitment of service and publishing with the journal

Specific Objective 1.5 UJAS attaining departmental status within the overall apex of NARO

Strategic Objective 2: To build an efficient and effective technical capacity for production of high quality journal

This strategic objective targets to build a competent technical capacity for production of high quality journal. It will resolve matters in building Competent Human Resource Capacity; as well as infrastructure for information management and quality assurance of journal articles.

Strategic Objective 3: To devise sustainable funding mechanisms for the journal

Presently, all the meagre funding for UJAS activities is being provided by NARO. This strategic objective will explore opportunities for different funding mechanisms that will enable UJAS reduce dependency on mother organization, NARO.

Strategic Objective 4: To increase the visibility of the journal for enhanced application of new knowledge and innovations for sustainable economic development

Any new knowledge and innovation can have impact only when it is accessed and used by a large population of the intended society. This strategic objective therefore responds to increasing the accessibility and conversion of the new generated knowledge and innovations by the society. It addresses three main critical areas described in specific objectives 4.1 to 4.3:

Specific Objective 4.1 Marketing and Publicity of UJAS

Specific Objective 4.2 Establishing Partnerships and Networks

Specific Objective 4.3 Impact assessment of the journal on Agricultural Development in Uganda and beyond

4.4 Strategic Outputs

Strategic Output 1.1: Institutional and Policy Framework Strengthened

It is expected that when institutional and policy framework is strengthened; the lack of fully designated human resource for the journal under NARO's functional structure and the lean budget currently characterizing the journal will be addressed. This will allow NARO to recruit core staff and improve funding for the journal, and intellectual property issues will be managed. Successful delivery of this output will contribute to enabling UJAS compete favourably in publishing world.

Strategic Output 1.2: Governance and Management of UJAS Improved

This Strategic Output aims at improving the governance and management that will have a far fetching effect on overall performance of the journal. The interventions will enable UJAS establish a functional world class Editorial Board,

adequate base of quality scientific peer reviewers and institute quality assurance and control mechanisms.

Strategic Output 1.3: Editorial Centre and Publishing House Established

This Strategic Outputs seeks to establish a state-of-art functional Editorial Centre and Publishing House for UJAS and other related services of NARO. The facility will significantly contribute to UJAS's ability to assert itself as a one-stop-centre of knowledge and innovations in agricultural and environmental sciences in the country and beyond.

Strategic Output 1.4: Commitment of service and publishing with the journal enhanced

This strategic output aims to nurture a high level of commitment of service and to attract a large base of clientele publishing with UJAS. This will be measured by increased number of committed scientific reviewers and, quality and quantity of publications in the journal.

Strategic Output 1.5: UJAS nurtured into a Departmental Status

To further strengthen the overall governance and performance of the journal, UJAS needs to disengage and discharge its day-to-day operations from NARO Secretariat. However the Secretariat will retain an oversight role for the journal. The implementation of this strategic output will result into UJAS attaining a Departmental Status within the broader NARO fraternity.

Strategic Output 2: Human Resource Capacity Built

Competent human resource is paramount for ensuring excellent performance of the journal. This strategic output will result into UJAS attracting, retaining and facilitating a professional and functional Editorial Board, competent Core Staff for the editorial centre and publishing house, and, adequate and output oriented Scientific Reviewer base.

Strategic Output 3: Sustainable Funding Mechanisms Enhanced

Adequate, sustainable and timely availability of financial resources is very critical for the successful growth of UJAS. It is therefore envisaged that this strategic output will devise sustainable funding mechanisms that will generate adequate and timely financial resources for developing and managing UJAS as a reputable publishing house.

Strategic Output 4.1: Marketing and Publicity of UJAS Enhanced

A wider public knowledge and awareness on the existence of UJAS is very critical in accessing and conversion of the published information and innovations to usable products and services. This strategic output seeks to enhance the visibility and readability of the journal in the market place. The

output will profile the relevance of UJAS to a wider stakeholder typology thus resulting into achieving the aspirations of the journal.

Strategic Output 4.2: Technical partnerships and networks established

Working partnerships and networks are very important to enable UJAS quickly improve its visibility among scientists, scholars and publishing house. This strategic output will enable UJAS to develop partnerships with the existing publishing platforms/associations and journal clusters; and develop networks with universities and research centres; as well as national, regional and international media houses.

Strategic Output 4.3: Impact of the journal on agricultural development established

The purpose of this strategic output is to frequently establish the impact of the journal in Ugandan society and beyond. Regular information on the impact of the journal will justify the investments, continued funding and improvement of the journal.

4.5 Conceptual framework

This strategy is anchored on four principle pillars: Enabling environment, ii) technical capacity, iii) funding and iv) application of knowledge and innovations. They inter-linkages amongst these pillars and resultant outputs are presented in the Figure 1.

4.6 How to Achieve the Strategic Outputs

Strategic Output 1.1: Institutional and Policy Framework Strengthened

NARO Functional Structure and Lean Budget: NARO's current Human Resource Structure and the Lean budget constraints the development and smooth functioning of the journal. To address these constraints, the NARO Management will need to establish a structural and functional Journal Office, set-up a publishing house with state of art ICT infrastructure, provide core funding for journal activities and devise imaginative funding mechanisms to support the expanded operations of the journal.

An ever-increasing level of competition from other journals world-wide: Despite the rapid advances in ICT, UJAS is yet to fully embrace the developments in communication technologies to wade off stiff competition from other journals. This will require UJAS to embark on deliberate effort to develop its capacity in publishing and keep current with the changing technological world. For- instance NARO should re-design, populate and sustain active UJAS website with full Open Access Provision.

Management of Intellectual Property Rights: To fulfil stakeholders' expectation on Intellectual Property, it will require NARO to fast track completion of the IP

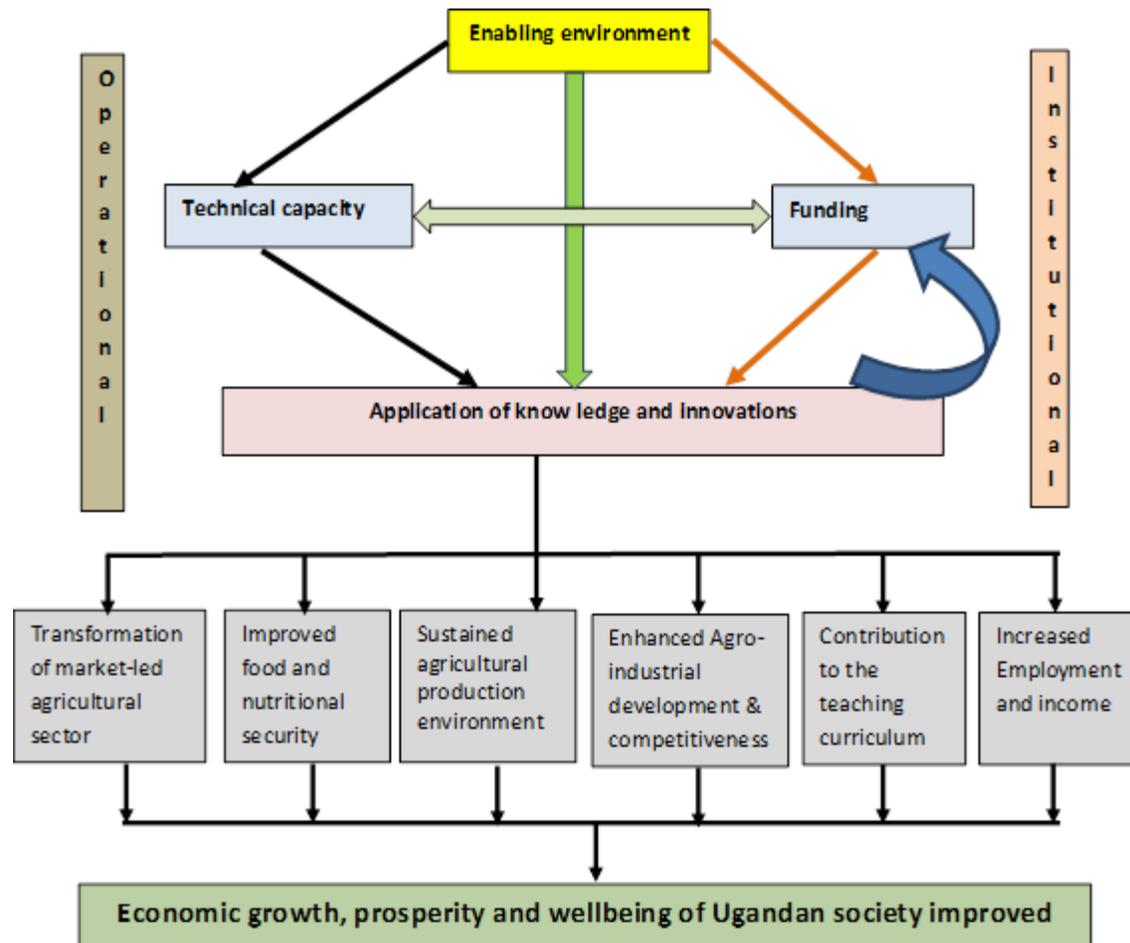


Figure 1. Conceptual framework.

framework and transit relevant clauses into appropriate guidelines for the authors and intending users of information.

Strategic Output 1.2: Governance and Management of UJAS Improved

Impediments to Editorial Board: The current editorial board is faced with multiple challenges that impede its performance. These include membership representation, disciplinarity, regionality and policy guidance. To address these challenges NARO and UJAS management will need to review the guidelines for appointing and dissolving the Editorial Board and devise strategies for compliance.

Need for willing and quality scientific peer reviewers: UJAS is faced with reluctance of identified reviewers to accept and review manuscripts for possible publication in the journal. To alleviate this problem, there is need for building a comprehensive database of scientific reviewers and devise reward system such certificate of recognition, waiver of publication fee for the reviewers to publish with the journal.

Instituting quality assurance and control mechanisms: For the journal to attain the highest standard and quality possible, the UJAS editorial board will be required to establish quality assurance and control mechanisms and strategies for compliance for the journal. This may also include putting in place systems that will periodically develop and update standard operating manuals and guidelines.

Strategic Output 1.3: Editorial Centre and Publishing House Established

To improve the overall performance and coordination of UJAS, myriad managerial constraints, and human resource capacity limitations, there will be need for NARO to establish an Editorial Centre and Publishing House for the journal. This facility will have to be robust enough to meet present and future technology needs. The facility may include an auditorium, library, offices, publishing unit and ICT infrastructure. It is envisaged that the facility will provide several services such as publishing of UJAS and books written by NARS scientists, as well as thesis.

Strategic Output 1.4: Commitment of service and publishing with the journal enhanced

It has been noted that there is low level of commitment of service and publishing with UJAS. In an effort to alleviate this challenge UJAS will be required to have a remuneration framework for its staff, reviewers and authors. Example of such remuneration may include salary for core staff, registration fee waiver for the editorial board and reviewers, certificate of recognition, author of the year, timeliness of the journal, invitation for scientific reviews, invitation of reviewers to give key note papers, cover page pictorials from the papers published etc.

Strategic Output 1.5: UJAS nurtured into a Departmental Status

For UJAS to further strengthen and sustain high quality service provision to the nation and beyond, critical managerial decisions need to be taken and implemented as quickly as possible with minimal consultation from NAROSEC. This calls for good will from NARO to initiate and nurture the process of UJAS transiting from its present status towards a fully-fledged departmental status under the wider NARO body.

Strategic Output 2: Human Resource Capacity Built:

The quality of the journal is impacted by a skewed professional composition of the editorial board, aggravated by a low base of quality scientific reviewers. The lack of well-developed training and skill development programs to enhance capacity of staff further compromises the quality of the journal. This will be more evident following the establishment of the editorial centre and publishing house with newly recruited staff. To resolve these issues, UJAS will be required to:

- Establish a functional Editorial Board that has a balanced membership of mixed competences in different critical professional fields with regional representation beyond Africa and policy guidance
- Promote good work ethics and standards to improve performance of Core and Operational Staff.
- Impart specialized skills on Core and Operational Staff to provide several services in publishing. These include (1) mentorship in scientific and science writing and review for scientists to learn how to write and review scientific publications, (2) capacity for journal cataloguing (competent managing editor together with assistant editor)
- Develop criteria for selecting and assessing the performance of Scientific Reviewers

Strategic Output 3: Sustainable Funding Mechanisms Enhanced

UJAS is presently having insufficient funding for its development and operational needs. Until now, UJAS has operated without a standalone budget line. To be able to address this limitation, NARO and Editorial Board will have to put deliberate efforts to devise mechanisms for sustainable funding of the journal. This may necessitate an early action for development of a resource mobilization management advisory note for achieving this intended purpose.

As UJAS is still young, a mixed funding model that consists of core and non-core funding will be of great importance for sustainable and successful growth of the journal. Strategic action points are as follows:

- NARO will be required to create direct budget line for UJAS and commit commensurate annual funds on the budget line
- Editorial Board and the planned Core staff will be required to impress on companies to buy space in the various issues of the journal publications.

- Editorial Board will be required to carry out regular intelligence searches for potential donors and submitting grant requests to support UJAS
- The Editorial Board will solicit for funds from great individuals and companies to provide financial support to the journal
- The Editorial Board will be required to create a society to support the journal through membership subscriptions
- NARO will be encouraged to develop and implement taxation guidelines that compel all projects under NARO funded by Donors and NARO-CGS to contribute a nominal publication sum of the project budget to UJAS.
- NARO and Editorial Board will be required to exploit other funding sources including: conference registration fees, consultancy fees, competitive re-print charges, provision of editorial and proof reading services, organizing special fund raising functions, publication of special supplementary issues, etc.

To further strengthen the funding sustainability, The Editorial Board will be required to practice and adhere to the established financial management and accounting systems.

Strategic Output 4.1: Marketing and Publicity of UJAS Enhanced

Profiling UJAS's image in the broader public: The journal is currently facing the challenge of low opinion among some local clientele. To resolve this matter, UJAS management will be required to embark on designing and relentlessly implementing programs to improve the image journal nation-wide.

Mechanisms for increasing accessibility of the journal: Presently the journal is facing the challenge of low visibility in the society. To address this challenge, NARO and Editorial Board will be required to devise mechanisms that will enhance easy and sustainable access of the journal to all clientele typology. Proposed mechanisms for increasing the journal visibility include:

- **Online Internet Publishing:** The technological advancement in internet has simplified, accelerated and significantly reduced the time and cost required to transfer and access knowledge and information in the world. Consequently United Nations has now considered Internet as a Human Right to access knowledge and information for fostering transition of human development. In addition the number of people in the world particularly developing countries using internet is ever increasing. To exploit this opportunity the Editorial board will be required to adopt the use of Open Access (OA) where the journal will be freely accessible online with print production on request.

The use of OA will bring substantial benefits to the journal and the Ugandan NARS. These benefits include: rapid increase in the visibility of the journal; researchers and scholars can read and build on the findings of others without restrictions thus increasing research outputs; since most of the research in agricultural and environmental sciences is paid using public and donor funds, OA allows taxpayers to quickly see the results on

investment; and improved education where OA enables teachers and their students easily access new research findings.

To provide open access, UJAS will use a model in which expenses including those of peer review, journal publications, and online hosting and archiving are recovered in part to compliment core funding from NARO, by charging a modest publication fee to the authors or research sponsors for each article they will publish. Under OA authors shall retain copyright for their article, but authors shall allow anyone to download, reuse, reprint, modify, distribute, and/or copy articles in UJAS journal, so long as the original authors and source and other attributions are cited.

- **Print and Electronic Media:** The print and electronic media has greatly developed thus reducing the cost and time of communication, as well as covering large geographical area within seconds. UJAS management will harness this opportunity as one of the marketing methods. It will adopt several products in the print and electronic media to reach different clientele typology. Some of the most important products that could be utilized are: e-mail advertisements, Short Message Service (SMS), Television (TV) and radio broadcasting; and buying space in newspapers.
- **Social Media Networks:** There exist several social media networks such as Face book and Twitter that use internet. A large world population particularly the young generation use them as one of the quickest means of socializing with many friends across the world within seconds. UJAS management will exploit these social media networks as one of the ways to quickly reach the world population.
- **Thomson Reuters' Web of Knowledge:** Thomson Reuters provides intelligent information to the world's businesses and professionals. It has several products that include: BIOSIS science citation index, BIOSIS Previews, contents of current journal issues, etc. This Web of Knowledge platform is of great benefit to the journal. To further quicken the process of improving the journal's Impact factor, the UJAS Editorial Board and NARO management will need to harness this opportunity.

Expanding diversity of journal products: At the moment UJAS has the journal as the only product, which has limited its clientele to scientists and scholars. To resolve this challenge, the Editorial Board will need to deliberately expand diversity of journal products that meets the taste of different stakeholder typologies. The suggested products include:

- UJAS Junior – it will target youth in secondary schools. This product is intended to initiate the upcoming young scientists into research and prime in them the publishing culture;
- UJAS Scientific – it will target scientists and scholars to strictly publish high quality scientific findings and innovations

To roll these products out quickly, the Editorial Board will need to adopt the approach of taking services to clients. The management will recruit youthful editor associates in tertiary institutions, secondary schools, parliament, and general society.

Building Brand Loyalty: To further strengthen the good position of the journal in publishing, the management will be required to build Brand Loyalty in market arena. This could be achieved through:

- Fast tracking the implementation of the proposed interventions for ensuring good performance of the journal
- Ensuring high quality productions of the different products of the journal
- Timely delivery of services (release of issues, displaying the list of accepted articles, re-prints, consultancies, etc.)
- Increasing frequency of annual issues and number of papers per issue to take care of expected increase in demand to publish with UJAS
- Accepting requests of special issues from different disciplines agricultural and environmental sciences.
- NARO will be required to pass a directive that compels every NARO scientist to publish at least one scientific paper with the journal every two years.

Unique marketing strategies: UJAS management will also need to tap into unique strategies for increasing publicity. The approaches include:

- Use of celebrities (sports, musicians, politicians, scholars, etc.) in increasing publicity of the journal in society
- Place marketing at different technical workshops and seminars of various stakeholders
- Personal marketing through oral presentations and circulates leaflets about UJAS

Strategic Output 4.2: Technical partnerships and networks established

Many publishing platforms, associations and journal clusters such as African Journals on Line (AJOL) and Bioline International, etc. are currently existing in the world. These journal clusters and platforms provide an opportunity for UJAS to be linked to over 500 other African Journals and the rest of the world for improved access and visibility. These platforms provide Open Access to quality research journals published in developing countries. To harness this great opportunity, the Editorial Board will need to establish and sustain working partnerships with these journal clusters and platforms.

In addition to international partnerships, local networks and partnerships with research institutes, tertiary institutions, secondary schools and relevant ministries is important to accelerate the growth of UJAS. The Editorial Board will be required to build strong local networks and partnerships with all these stakeholder typologies. Network of UJAS contact persons or agents in all these institutions will quickly enhance local visibility of the journal.

Strategic Output 4.3: Impact of the journal on agricultural development established

Currently there is no information how the journal has impacted on the clientele and agricultural development in the country. The journal management will be required to generate this information at a frequency determined by the Editorial Board. The information will be generated through commissioning several studies that include:

- Baseline information on the current position of UJAS including the impact created on the clientele.
- Studies on the impact of the journal on agricultural development
- Changes in the research and publishing culture among scientists, students and the youth
- Studies on the impact of the journal on the NARS

5 STRATEGY MONITORING AND PERFORMANCE EVALUATION FRAMEWORK

NARO through the Directorate of Technology Promotion and Innovation Support (TPIS) will be responsible for the implementation of this strategy. The directorate will be expected to expedite the strategy upon ratification by the NARO Council. The monitoring of the implementation process will be responsibility of NARO Top Management. In addition, the UJAS Editorial Board will periodically review the progress of implementation of the strategy and will advise NARO Top Management on appropriate action. The monitoring and evaluation will be based on the strategic targets set in the implementation plan and milestones (Table 1) and strategic performance measurement indicators (Table 3). At the end of implementation of the strategy, it is envisioned that UJAS would have transformed into a highly competitive platform for sharing scientific knowledge, information and innovations in Agricultural, Environmental and Social Sciences.

Table 1: Strategic implementation plan and milestones

| Strategic Objectives | Key Activities | Year | | | | | | | | | | | | | | | | | | | |
|----------------------|----------------|------|------|--------|----|----------|----|------|-------|------|----|------|----|------|----|------|----|------|----|------|----|
| | | 2014 | | 2015 | | 2016 | | 2017 | | 2018 | | 2019 | | 2020 | | 2021 | | 2022 | | 2023 | |
| | | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 | H1 | H2 |
| Objective 1 | Activity 1.1 | | 1 | 2, 3,5 | 4 | | | | | | | | | | | | | | | | |
| | Activity 1.2 | | 6, 7 | 8 | | 9, 10,11 | 12 | | | | | | | | | | | | | | |
| | Activity 1.3 | | | | | 13 | | 14 | | 15 | | | | 16 | | | | | | | |
| | Activity 1.4 | | | | | | | | 17,18 | | | | | | | | | | | | |
| | Activity 1.5 | | 19 | 20 | | | | | | | | | | | | | | | | | |
| Objective 2 | Activity 2.1 | | | | 21 | 22 | | | | | | | | | | | | | | | |
| | Activity 2.2 | | | | | 23 | | | | | | | | | | | | | | | |
| | Activity 2.3 | | | | | | | | | | | 24 | 25 | | 26 | | | | | | |
| | Activity 2.4 | | | 27 | | | | | | | | | | | | | | | | | |
| | Activity 2.5 | | | | 28 | | | | | | | | | | | | | | | | |
| Objective 3 | Activity 3.1 | | | | 29 | | 30 | | | | | | | | | | | | | | |
| | Activity 3.2 | | | | | 31 | | | | | | | | | | | | | | | |
| Objective 4 | Activity 4.1 | | | | 32 | | | 33 | | | | | | | | | | | | | |
| | Activity 4.2 | | | 34 | 35 | | | | | | | | | | | | | | | | |
| | Activity 4.3 | | | | 36 | | | | | | | | 37 | | | | | | | | 38 |

Legend: H1 = Calendar period January to June, H2 = Calendar period July to December.

Milestone numbers in the cells are explained in Table 2.

Budget for each Key Activity is shown in Table 2.

Table 2: Description of Milestones in Table 1 and corresponding estimated Budget

| Key Activity | Milestone | Budget (US'000) |
|--|--|------------------------|
| Activity 1.1: | Strengthen institutional and policy framework | 15.0 |
| | 1 Human resource framework for UJAS editorial and publishing centre established by December 2014 | 3.0 |
| | 2 Approval for direct budget allocation from NARO vote for UJAS secured by June 2015 | 1.0 |
| | 3 Policy statement by NARO Council compelling NAROSEC and research institutes to create a publication fund for sustaining UJAS approved by June 2015 | 1.0 |
| | 4 IP guidelines to foster protection of both author and the institution integrated in UJAS by December 2015 | 10.0 |
| 5 Policy statement by NARO Council compelling each scientist to publish at least two articles with UJAS every four years approved by June 2015 | 1.0 | |
| Activity 1.2: | Improve Governance and Management of UJAS | 16.0 |
| | 6 Qualification framework for human resource to serve on the editorial board established by December 2014 | 1.0 |
| | 7 Guidelines for appointing and dissolving Editorial Board reviewed and operationalized by December 2014 | 1.0 |
| | 8 Criteria for selecting, assessing and rewarding reviewers developed by June 2015 | 3.0 |
| | 9 Quality assurance processes and methods to affirm quality of the journal established by June 2016 | 3.0 |
| | 10 Quality assurance committees to oversee peer reviewed mechanisms for the journal established by June 2016 | 3.0 |
| | 11 Procedures for client feedback mechanisms to enrich the quality of the journal established by June 2016 | 3.0 |
| | 12 Quality improvements in UJAS management and governance strengthened by December 2016 | 2.0 |
| Activity 1.3 | Establish editorial centre and publishing House | 2,125.0 |
| | 13 A concept for establishment editorial centre and publishing house developed and submitted to the NARO Council approval by June 2016 | 5.0 |
| | 14 Architectural design of the editorial centre developed by June 2017 | 100.0 |
| | 15 Funds for the civil works and equipment secured by June 2018 | 20.0 |
| | 16 Editorial centre fully constructed, equipped and operational by December 2020 | 2,000.0 |

| | | |
|---------------------|---|-------------|
| Activity 1.4 | Enhance commitment of service and publishing with the journal | 4.0 |
| 17 | Remuneration framework for staff, authors and reviewers established by December 2017 | 2.0 |
| 18 | Mechanisms for efficient and effective production of quality journal established by December 2017 | 2.0 |
| Activity 1.5 | Advocate for UJAS to attain departmental status | 6.0 |
| 19 | A departmental structure of UJAS established by December 2014 | 1.0 |
| 20 | A decision by the NARO Council to create the Department of UJAS granted by June 2015 | 5.0 |
| Activity 2.1 | Set up a functional Editorial Board | 5.0 |
| 21 | An editorial board with desired, competences, skills and attributes established by December 2015 | 1.0 |
| 22 | Tools for periodic performance assessment of editorial board members developed and operationalized by June 2016 | 4.0 |
| Activity 2.2 | Develop Code of Conduct and performance standards for the Journal | 2.0 |
| 23 | Standards for quality assurance of the journal developed by June 2016 | 2.0 |
| Activity 2.3 | Train and mentor core editorial staff | 203 |
| 24 | Special training needs for management of editorial centre and publishing house identified by June 2019 | 3.0 |
| 25 | Staff trained on special skills for managing editorial centre by December 2019 | 100.0 |
| 26 | Mentoring and coaching schemes to enhance the capacity of the editorial staff designed and operationalized by June 2021 | 100.0 |
| Activity 2.4 | Establish an active website for the Journal | 3.0 |
| 27 | Active, interactive and dynamic website for the journal established by June 2015 | 3.0 |
| Activity 2.5 | Build a data base of Scientific Reviewers | 1.0 |
| 28 | Bio and professional data of scientific reviewers in critical fields assembled by December 2015 | 1.0 |
| Activity 3.1 | Diversify funding sources for the journal | 18.0 |
| 29 | A resource mobilization plan developed and operationalized by December 2015 | 15.0 |
| 30 | Guidelines and limits for journal handling fees established by December 2015 | 3.0 |
| Activity 3.2 | Practice good financial management systems | 5.0 |
| 31 | A financial administrator to manage financial resources of the journal recruited by June 2016 | 5.0 |

| | | |
|-----------------------------|---|--------------|
| Activity 4.1 | Improve Marketing and Publicity of the journal | 50.0 |
| 32 | A comprehensive marketing plan for UJAS developed by December 2015 | 15.0 |
| 33 | Awareness of UJAS amongst stakeholders created by December 2017 | 35.0 |
| Activity 4.2 | Establish Partnerships and Networks | 3.0 |
| 34 | Partnership framework established by June 2015 | 1.0 |
| 35 | Strategic partnerships to enhance the quality of publishing established by December 2015 | 2.0 |
| Activity 4.3 | Measure the impact of the journal on Agricultural Development | 45.0 |
| 36 | Baseline information on the contribution of UJAS to agricultural development generated by December 2015 | 15.0 |
| 37 | Med-term review of the strategic interventions conducted by December 2019 | 15.0 |
| 38 | Impact of UJAS on agricultural development conducted by June 2023 | 15.0 |
| Total Budget (US \$) | | 2,500 |

Table 3: Strategic performance indicators

| No | Strategic Output | No | Indicators |
|-----|--|-------------------------|--|
| 1.1 | Institutional and policy framework strengthened | 1.1.1 1.1.2 1.1.3 | Percentage change in NARO core funding for UJAS Number of articles published by NARO staff (disaggregated by gender and PARI) Number of core staff working for UJAS (disaggregated by gender, profession, speciality) |
| 1.2 | Governance and Management of UJAS improved | 1.2.1 1.2.2 1.2.3 | Number of journal articles received Proportion of journal articles rejected (Rejection rate) Proportion of articles published (Acceptance rate) |
| 1.3 | Editorial centre and publishing House established | 1.3.1 1.3.2 1.3.3 | Number by type of infrastructure acquired for the editorial centre and publishing house (civil works, machinery, equipment, computers, furniture etc.) Number of copies by volume of UJAS published Number of people accessing UJAS online as measured through [number of hits proxy] |
| 1.4 | Commitment of service and publishing with the journal enhanced | 1.4.1 1.4.2 1.4.3 | Number of reviewers rewarded (disaggregated by gender, type of reward, reason for reward) Number of journal articles received (repeated) (disaggregated by author affiliation –NARO and non-NARO) Level of satisfaction of authors, reviewers and staff with the remunerations, rewards, working conditions, job security etc. |
| 1.5 | UJAS departmental status attained | 1.5.1 1.5.2 | Percentage change in UJAS departmental budget (from both NARO and non-NARO fund sources) Volume of revenue generated by the department (disaggregated by fund source) |
| 2.1 | A functional Editorial Board established | 2.1.1 2.1.2 | Number of editorial board approved activities/events held Proportion of editorial board members meeting 70% performance mark from individual appraisal assessments |

Table 3: Continued

| No | Strategic Output | No | Indicators |
|-----|---|-------|--|
| 2.2 | Code of Conduct and performance standards for the Journal developed | 2.2.1 | Proportion of approved standards for journal quality assurance adhered to |
| 2.3 | Core editorial staff trained and mentored | 2.3.1 | Number of editorial staff whose capacity building needs have been addressed and are applying the skills in the UJAS editorial work (disaggregated by type of capacity building and gender) |
| 2.4 | An active website for the Journal established | 2.4.1 | Number of people accessing UJAS online as measured through [number of hits proxy] |
| | | 2.4.2 | Number of 'likes' registered from website users |
| 2.5 | A data base of Scientific Reviewers built | 2.5.1 | Number of scientific reviewers profiled on database |
| 3.1 | Funding sources for the journal diversified | 3.1.1 | Number of UJAS funding sources |
| | | 3.1.2 | Percentage change in journal funds (showing fund source) [repeated] |
| 3.2 | Good financial management systems practiced | 3.2.1 | Number of unqualified audit reports |
| | | 3.2.2 | Number of ineligible expenditures |
| 4.1 | Marketing and Publicity of the journal improved | 4.1.1 | Number of awareness creation activities carried out |
| | | 4.1.2 | Number of stakeholders accessing the journal (both hard copy and online) [repeated] |
| | | 4.2.3 | Number of UJAS journal citations (webmetrics) |
| 4.2 | Partnerships and Networks established | 4.2.2 | Number of functional partnerships established (with signed MoUs) |
| 4.3 | Impact of the journal on Agricultural Development measured | 4.3.1 | 4.3.1.1 Number of technologies generated with UJAS published 4.3.1.2 Changes in welfare of knowledge through citations technology (in 4.3.1.1) beneficiary stakeholders [Proxy] |

6 REFERENCES

AgCLR: Uganda – Commercial, Legal and Institutional Reform in Uganda's Agriculture Sector - September 2010.

African Journals Online (AJOL): <http://www.ajol.info/>

Bioline International: <http://www.bioline.org.br/>

BIOSIS Citation Index/Thomson Reuters: <http://www.thomsonreuters.com/biosis-citation-index/>

National Agricultural Research Act 2005.

National Agricultural Research Organisation (NARO) Strategic Plan 2008/09 – 2017/18.

National Agricultural Research Policy 2002.

PLOS One Journal: <http://www.plosone.org/>

http://en.wikipedia.org/wiki/List_of_scientific_journals

Uganda Bureau of Statistics – 2008.

Ministry of Finance Planning and Economic Development: Uganda Vision 2040 (Draft).

Ministry of Agriculture, Animal Industry and Fisheries 2010: *Agriculture for Food and Income Security: Agricultural Sector Development Strategy and Investment Plan: 2010/11 – 2014/15.*