

University-Industry Linkage practice in Ethiopia: A Study on Debre Markos Institute of Technology, Debre Markos University

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Abstract-It is recognized that the importance of linkage of higher education institutions with various industries for a given country sustainable development. However, in one or another way the linkage between institutes/universities and industries seems to be very weak particularly in developing countries. This study aimed to assess major areas and challenges of UIL and measures to be taken for sustainable linkages in Ethiopia: the case of Debre Markos Institute of Technology. For the sake of achieving this objective, primary data was collected through a structured questionnaire from a sample of 142 officials, chairholders, and academicians, and they were selected using systematic random sampling techniques. Then descriptive narrations through concurrent triangulation strategy were applied to analyze the data collected using questionnaires were analyzed using SPSS 23 and expressed in frequency and relative important indexes. Hence, lack of financial support, apathy among academic staff, weak engagement after the signing of MoU, and fragmented research endeavors were found significant factors in determining University-Industry Linkage in DMIT. The result of the study indicates that student internship programs and sponsoring research works are the two major areas where the institute is collaborating with the industries and thus, the institute/university has to reform its incentive mechanism for researchers. Academicians should also have to conduct demand-driven and quality researches on the industries to gain industries' trust. The institute-industry linkage office should re-establish again as the University-Industry Linkage office with a directorate level with having a duet of making collaboration beyond student internship.

Keywords-Industry, Debre Markos Institute of Technology, Linkage, Practice, University

1. INTRODUCTION

Over the last two decades, Ethiopia has made a great stride in expanding tertiary education and industries. This notable and commendable expansion, however, came at the expense of quality education, which is the primary mission of universities. While they are doing these, they give less attention to University-Industry Linkages/UIL, which have a significant effect on graduate start-ups. Rather than physical infrastructures, such as roads, bridges, and railways, "the key element" of a knowledge economy's infrastructure is the entrepreneurial university. Accordingly, many world-class universities around the globe have transitioned from talking about UIL to entrepreneurial universities.

In Ethiopia, the problem cuts both ways as "Most Ethiopian industrial enterprises have the weak absorptive capacity for externally generated knowledge," And industry players see universities as "Unimportant information sources for Ethiopian industry's innovative activities." Rather than integral parts of their local communities, universities continue to viewed as islands. That is not all: before universities talk of university-industry transfers, the university needs to build capabilities "to transfer" as a preparation for its expanded engagement with the external environment.

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As universities are public institutions, the internal registration procedure following an application often prevents a project from being realized at speed demanded by the industry. The question is, therefore, no longer how Ethiopian universities can make University-Industry linkages worth the while. Successful industry-university collaboration needs to support the missions and motivations of each partner. For universities, typical motives to collaborate with industry include the improvement of teaching, access to funding, reputation enhancement, and access to empirical data from industry. Bureaucratic hindrances experienced in mutual relationships slow down the rate of collaboration and extend the time taken to complete projects.

Effective and efficient UIL is a necessary condition for knowledge and technology transfer from the university to the industry. University graduates and research outputs have to be absorbed by the industry. The industry is also a source of finance for university research activities and sources of information for quality assurance so that graduates with a high level of knowledge and skills, as required by every industry, can be produced. The outcomes of research undertaken by universities have to transferred to the industry. Then it should be integrated into the products and services of the industry and impact the living standard of the society. For this, Debre Markos Institute of technology of Debre Markos University pursues and encourages technology transfer through both formal and informal channels through its

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research, community service, university-industry linkage, and technology transfer office. In countries like Ethiopia, where the culture of indigenous technology development and utilization is low, and most industries are traditional trade-based, formal UIL and technology transfer channels have to be pursued aggressively. In the official channels, the Institute can initiate and work through the linkage for sufficient knowledge and technology transfer.

Debre Markos Institute Technology/DMiT of Debre Markos University/DMU is, a higher education institution in Ethiopia established to furnish higher education. UIL refers to the symbiotic relationship that exists between the institute/university and industry with the support and facilitation of the government unlike in the conventional system and owing to a diversity of factors in an engineering setting, the concept has encountered challenges. The current study, therefore, aims at assessing UIL practice at Debre Markos institute Technology. The study seeks to identify areas for linkages, challenges faced as well as actions to remedy the situation for future improvement.

1.1. UIL in Technology Institute of Debre Markos University

Before 2008, Ethiopian University and Industry communication were based on - 2 Months apprenticeship program (industrial attachment) and - Industrial visits. DMiT at DMU is one of the youngest institutes of technology offering higher education in the fields of engineering and technology since its establishment as a collage of technology in 2008. The Institute is now trainee about a total of 2382 students in 7 and 4 undergraduate and postgraduate programs respectively. In addition to this, it has well equipped 45 different laboratories and workshops, 327 teachers, 56 technical assistants, and 25 administrative staff required for research and practical teaching and to deliver different technical support to its main stakeholders.

Besides its responsibility to render quality education to the students, DMiT has also other two major obligations that connect it directly to the community; i.e. research and community service. are provided by executive directorates. The directorates strive to deliver the necessary services and activities to the community, surrounding industries, and in general to the country's growth and development. However, the interaction of the institute with the surrounding community and industries is not found as to where it expected or demanded. Engagement in a mutually rewarding on-going collaboration with its stakeholders is still one of the missions of DMiT.

Link the institute to industry for mutual benefit, assist in the establishment of a partnership with local and international organizations, organize the development of policies and guidelines of institute industry linkage in collaboration with relevant offices of university, link institute academic staff with industry for collaborative research, training and consultancy work, identify and prioritize researchable issues in collaboration with stakeholders, coordinate and facilitate the transfer and implementation of research outputs, Coordinate seminars, and workshops for University-Industry

relationships, and arrange opportunities in the industry for practical experience for staffs and students are some of the duties and responsibilities of the DMiT, RCSTT Directorate.

1.2. Objectives

The objective of this study was to assess the University-Industry Linkage practice in Ethiopia: The case of Debre Markos Institute of Technology, Debre Markos University. It will be done by assessing the current university-industry linkage, identifying the challenges which are prohibiting good linkage, and proposing ways for strong university-industry interaction.

2. LITERATURE REVIEW

The history of industrial enterprises in Ethiopia is a very short one compared to its early civilization and independence which dates back over three thousand years. On the other hand, the main aim of higher education institutions is to train mature citizens and carry out research and consultancy activities to make significant impacts on the country's development in various sectors of the economy. To this effect, the higher education institutions have been imparting fundamental education to students and carrying out research activities in their faculties and institutions. For instant FDRE.HEP,[1], underscores that "every institution shall have the responsibility to forge relation with industries for mutual benefits." And Article 26.6 of the Proclamation also requires that "higher education institutions should avail the knowledge and skills acquired in their premises to the wider community".

The National Science, Technology and Innovation (STI) Policy [2], define and support how the country will in the future search for, select, adapt, and utilize appropriate and effective foreign technologies as well as addressing the establishment of the national innovation system. Research, technology transfer, human resource development, university-industry linkage, and intellectual property systems are among the eleven critical policy issues considered in the STI policy directions and strategies. The policy establishes a national STI council and a forum for university-industry collaboration to regulate the national research and innovation priorities and systems. Technology Institute of Debre Markos university is one of the members of the forum in the group of North-Western Ethiopian UIL form with another regional institute such as BDIT, UG, KIOT, DTU, Amhara Regime TVET office, Amhara Regime Construction Office, Amhara Regime Housing Agency, Bahir Dar City construction office, and housing agency. Similarly, the Research and Technology Transfer Conceptual and Governance Framework of Ethiopian Higher Learning Institutions define the vision, mission, and objectives of research and technology transfer framework including opportunities and challenges [3]. A framework regarding technology transfer, university-industry linkage, and directions to strengthen research and technology transfer in the Ethiopian Universities are among the focus areas of this national framework.

Universities have long been recognized as sources of knowledge creation, innovation, and technological advances [4,5][6]. Better means for developing and using technology and knowledge have become critical for basically any country in the world [7][8]. Knowledge transfer activities between academic and private sectors contribute to firms' competitiveness and the growth of the economy as a whole [9]. Synergies between higher education institutions and industries can play a critical role in securing and leveraging additional resources for higher education, promoting innovation and technology transfer, and ensuring that graduates have the skills and knowledge required to effectively contribute to the workforce [10]. The study by Teklay Y. and Ayenew A [11] shows that in Ethiopia, the university-industry linkage is at its infant stage and the common types of interactions are limited to the student internship programs, consultancies, and training programs. The increasing reliance on knowledge in industry and services is generating strong incentives to develop more efficient ways to transfer the discoveries made in academia to business [12]. Teklay Y. and Ayenew A [11] state innovation and technological advancements are key elements in a country's economic competitiveness and economic development. In addition to that, [11] discussed that Universities are expected to play a central role in the development of such works both by producing the required professionals and participating directly or indirectly in it. Although this is the truth on one side, industries and the government should also have their share in establishing a strong linkage between universities and industries to bring innovation, technological advancement, and other benefits related to these [13].

[14] discussed knowledge and technology innovation are known to source of global competitiveness leading to economic growth and development and it has elevated the importance of University and industry collaboration in higher education policymaking at both institutional and national levels. Beside it discussed that Universities and industry interact in various ways like in the form of collaboration, engagement in academic, commercialization, patenting, spinning-off work. Academic and industry, which for a long time have been operating in separate domains, are rapidly inching closer to each other to create synergies [15].

The role of the University as a strategic resource is a prominent feature that brings it to the inner circles of any national development agenda. Thus, countries at different or at extremely dissimilar stages of socio-economic and political environments as well as industrial and technological development have tried to use their universities for sustainable development [8]. Ethiopia is not an exception in this regard.

2.1. Areas of university-industry linkages

According to Estifanos Y. & Melaku A [16], the areas of linkage between the university and the industries are not as such exciting and student internship and training program are the two areas which have a satisfactory level of linkage.

Internship, consultancy services, research, and pieces of training are the main work universities are interacting with industries in Ethiopia [11]. Internship, consultancy, and research are the major areas of linkage in Addis Ababa University, Jimma, Bahir Dar, and Mekele Institute of Technology [6]. Research, commercialization, consultancy, training/ industrial attachment, resource sharing, and knowledge transfer were the five different mechanisms for UIL in research Universities [12]. Establishing organizations and programs, science parks, and technology incubators and technology funds that connect research with business and catalyze collaboration are the main mechanisms for successful UIL [13].

2.2. Challenges in University-Industry Linkage

Challenges in creating strong linkage with the industries at the university or institute level are diverse and depend on each university or institute's circumstances. Low-level enforcement power of the existing national policy which enforced the university and the industry to create strong linkage following the national interest, the non-existence of University Intellectual Property Right Policy (IPR), and institutional policy for university-industry linkage are the major challenges that Ethiopian higher education institution faces [8]. Lack of robust and overarching national framework, limited attention and inadequate funds, inadequate institutional commitment, and support at all levels, and shortage of capable staff are barriers for a positive link [8]. Lack of infrastructures such as laboratories, testing facilities, qualified and experienced staff are among the obstacles of UIL in Ethiopia [13]. Besides this, the characteristics of firms, namely the size and industrial sector, modes of collaboration influenced collaboration among stakeholders [9]. Poor communication from the UIL office, Industries not responding well, and Lack of motivation from academics the main sources of weak linkages [6]. Lack of laboratory facilities, inadequate infrastructures, time constraints due to heavy teaching load, and lack of strong industry linkage offices are identified as the main barriers for collaboration with industries [11]. Lack of clarity on the university procedures and process, the poor tendency of university's orientation on U-I research, lack of quality leadership, inadequate incubation centers, and poor communication are identified as the obstacles of UIL [16].

2.3. Mechanisms to improve linkage of university-industry

A spin-off company, training/ seminar/ workshop/ conference, student internship/ staff attachment, and appointment of industry advisory panel are of the type of mobility for strong UIL [12]. According to [8] incentive, allocating sufficient fund, leadership should be committed to creating the linkage, University-industry and government must establish working modality and strongly working on awareness creation of industries owner by creating continuous workshop, discussion seminars, dialog forums as well as to have annual research call for industries to promote are the

main strategies for building concrete university-industry linkages. Active participation of the private sectors in curriculum development especially in areas of entrepreneurship and technology should be considered and ensured for strong linkages [13]. Both strategic and operational management issues like guidelines have to be established which allow universities to make use of these relations to better fulfill their overall mission, structures, rules, procedures, financial and personnel management are becoming increasingly important [17]. Promoting technology licensing from universities, personnel exchange may be an appropriate policy for strong linkages [9]. Encourage regular industrial visits by staff, Setup strong U-I linkage units in universities, and Organizing workshops in the presence of all stakeholders some of the promotional mechanisms of linkages [6]. Improving laboratory facilities, conducting workshops for industry staff, encouraging regular industry visits by academics, and setting up strong and decentralized industry linkage offices are identified by academics as the main measures to promote collaboration with industries [11]. Training, advocacy for increased funding, and establishment and management of science parks and technology incubators for technology transfer are methods for strengthening linkages among universities and industries [10]. The university should reform the incentive mechanisms for the university's academicians for those who are researcher and engaged in collaboration work with industries [16].

3. METHODOLOGY

In this study, a mixed research approach was employed. This is due to the reason that many good types of research are conducted through a combination of qualitative and quantitative research approaches and the nature of the study that requires describing and explaining quantitatively and qualitatively [18]. The study was targeted at Debre Markos Institutes of Technology of Debre Markos university of 220

active academicians and a random sampling technique was used. Then sample size was determined by applying a formula provided by [19], i.e.

$$n = \frac{N}{1+Ne^x} \dots \dots \dots eq. 1 \quad n = \frac{220}{1+220(0.05)^2} = 142$$

An open and closed-ended questionnaire was mainly used for data collection. From 142 respondents; directors, school deans, academics program vice deans, program coordinators, officers, specialization chair holders, and senior staff were involved. Additionally, data was collected by some key informant interviews with the industry linkage officers of the institutes and university. SPSS 23 and MS Excel were used to analyzed and identify the areas of UIL, challenges, and the ways forward using frequency index(FI) and relative importance index(RII) methods as shown in (eq.2) and (eq.3) respectively. RII is applied to measure the response related to the rating of each variable to now the significance of it. In addition to that, it measures the importance level of each element based on five points Likert scale from low to highly important.

$$FI\% = \sum_{a=5}^5 a \left(\frac{n}{N}\right) * \frac{100}{5} \quad (eq.2)$$

$$RII\% = \frac{[5n_5+4n_4+3n_3+2n_2+n_1]}{5*N} \quad (0 \leq RII \leq 1)(eq.3)$$

According to Akadiri [20] importance level for RII is as follow: $0.8 \leq RII \leq 1$; High, $0.60 \leq RII \leq 0.88$; High medium, $0.40 \leq RII \leq 0.6$; Medium, $0.20 \leq RII \leq 0.40$; Medium-low and $0 \leq RII \leq 0.20$; Low.

4. RESULT AND DISCUSSIONS

4.1. Characteristics of the respondents

The respondents who participated in the study are given in Table 4.1 with their academic's programs, education level, experiences, and position in the institute.

Table 4.1. Genral respondants characteristics

Accademics Program	Freq. (%)	Positions in DMiT/DMU	Freq. (%)	Experience in universities/institute	Freq. (%)	Education level	Freq. (%)
Civil Eng.	27.5	Diractors/ Deans	4.9	4 to 5 years	16.9	BSc/BA	1.4
CoTM	14.8	Officers	6.3	6 to 8 years	54.9	MSc/MA	91.5
E&C. Eng.	14.1	Chair holders	19.0	9 to 10 years	21.1	PhD/Assis tant professor	7.0
IT	7.0	Senior staffs	31.0	above 11 years	7.0		
HWRE	15.5	Staffs	38.7				
SE.Eng.	4.2						
ME. Eng.	16.9						

Notes: Eng.> engineering, CoTM>Construction Technology and Management, E&C >Electrical end Computer, IT>Information Technology, HWRE> Hydraulic Water Resource Engineering, SE.>software, ME.Eng.>Mechanical, Freq.> Frequency,

From Table 4.1 the main respondents of the questionnaires were Civil, ME, HWRE, and CoTM with a frequency of 27.5%,16.9%,15.5%, and 14.8% respectively this

is due to large numbers of staffs in the proportions. On the other hand, 69.7% of academic staffs with 91.5% of MSc/MA degree and having work experiences of 6 to 8 years. This

insight into the study, the respondents have good knowledge about UIL in DMiT, as a result, they provided the right information. It can also be seen that from categories of the academic qualifications master’s degree and assistant proffers were dominated in the institute.

4.2. UIL Practice and responsible organs in DMiT

Respondents were asked to judge the status of industry linkage in the institute. As the result shown in Table 4.2, most of the respondents, 61%, believe that all staff of the institute has a duet to make collaborate with their respective stakeholders. On the other hand, 60.6% of the respondent judges the institute/university internal policies

encouragement for university-industry linkage is medium. As a result, the institute/university internal policies for linkages should get attention. In addition to that 59.8% of the respondents acknowledge that there is a linkage that is in the form of student internship, staff externship, consultation service, training. The other 40.2% of the respondents’ response indicated that there is no linkage at all between the university and the industries, respectively. The link mainly focuses only on internship programs. Even the internship programs are not as important both to the students and the industries. Most of the students consider the program as fulfillment criteria for getting their degree.

Table 4.2 The Insititute interaction with industry

Responsibility for making linkage/collaboration between institute and industries	Freq. %	Institute/university internal policies encourage university-industry linkage	Freq. %	Do you think that there is a linkage b/n industries and DMIT	Freq. %
Top management of the institute	10.5	very low	14.1	Yes	59.8
UIL officers of DMiT	7.4	Low	19.0		
All staff of DMiT	61.0	Medium	60.6		
UIL Directorate of DMU	7.7	very high	6.3	No	40.2
UIL officer of DMiT & UIL Directorate of DMU	13.4				

4.3. Major areas of University-Industry Linkages

Table 4.3 illustrates that the areas of linkage between the DMiT and the industries are not as exciting. Student internship programs, sponsoring research works, improvement of teaching, research and production capacities, good image building and externship programs for staffs are the top five areas which have high importance level for areas of linkage. On the other hand, consultancy services, contractual business training, demonstration, and publications of research, curriculum development, commercialization of intellectual property, and technology transfer are found that the other areas of linkage are with the high-medium level of importance. Even if most of the areas

are the keys to producing qualified graduates, solving community problems, and in general fostering economic development, the interaction of the institute with the industries is low. These indicate that the institute and industries are not striving for stronger interaction between themselves.

The excellence in engineering and technology education and research is attributed to many factors among which the institute/university-industry linkage has proven to be very important. It is the most effective mechanism where both the institute/university and the industry act as complementary organizations to share resources to achieve a common goal.

Table 4.3. Areas of University-Industry Linkages in DMiT

Major areas of University-Industry Linkages in DMiT	RII	Rank	Important level
Student placement/Internship Programs	0.908	1	High
Sponsoring research works	0.825	2	High
Improvement of teaching, research and production capacities	0.817	3	High
Good Image Building	0.811	4	High
Externship programs for staffs	0.809	5	High
Consultancy Services	0.785	6	High- Medium
Increases employability/Direct employment opportunities for graduates	0.785	6	High- Medium
Scholarships	0.773	8	High- Medium
Workshops and seminars	0.755	9	High- Medium
Prototypes developed by institute	0.734	10	High- Medium
Increases job creation through business startups and incubation programs	0.732	11	High- Medium
Contractual business training	0.724	12	High- Medium
Demonstration and Publications of research	0.710	13	High- Medium
Curriculum Development	0.696	14	High- Medium
Commercialization of intellectual property	0.668	15	High- Medium
Technology transfer	0.635	16	High- Medium

4.4. Challenges of UIL in DMiT

This part focused on factors that determined the University-Industry Linkage from the academician and leaders of the institute perspectives. As shown in table 4.4, the major factors that hinder the linkage among DMiT and the stakeholders are found that lack of financial support, apathy among academic staff, weak engagement after signing of MoU, fragmented research endeavors, and lack of marketable products with importance levels of high. On the other hand, poor leadership of UIL, lack of recognition & incentives for staff, the institute structure, and policy

towards collaborations with industry were found the list factors as challenges for UIL in DMiT. This indicates as the institute has a strong and convenient staff, leaders, structures, and policy for the strong linkages with the industries. That is why in the institute held on one-day workshops in February 2020 with the title “University Industries linkage for Sustainable Relationship Among Stakeholders “to overcome the barriers for making strong linkage

Table 4.4. Challenges of UIL in DMiT

Challenges of UIL in DMiT	RII	Rank	Important level
Lack of financial support	0.848	1	High
Apathy among academic staff	0.839	2	High
Weak engagement after the signing of MoU	0.825	3	High
Fragmented research endeavors (none thematic and not need-based)	0.809	4	High
Lack of marketable products (e.g. Prototypes and research outputs) of the institute	0.803	5	High
Lack of motivation and entrepreneurial skills & knowledge	0.768	6	High Medium
Weak availability of collaborative center (incubation center, liaison office, participation in conference & workshop, Informal contact)	0.748	7	High Medium
The time constraint of staffs due to heavy teaching and administrative works	0.741	8	High Medium
Absence of national IP policies and laws	0.731	9	High Medium
Institutes curriculum irrelevance	0.714	10	High Medium
The institute/university has no policy towards collaborations with industry	0.694	11	High Medium
The institute structure is not adapted to the needs of industrial collaboration	0.687	12	High Medium
Lack of recognition & incentives for staff	0.656	13	High Medium
Poor leadership of UIL	0.604	14	High Medium

4.5. Support Services Needed for Strengthening Linkages with the Industries

Table 4.5 shows measures to improve university-industry interactions as per the perception of academics and officials of the institutions. Accordingly, the main effective steps to promote interaction as perceived by academics and officials of the institutions were conducting seminars, workshop, conferences/events to network with industries/enterprises, make balanced relationship and commitments among

stockholders, encouraging regular industrial visits by staff, conducting need assessment for research and providing enough fund for collaboration are the top five measures to be taken for strong and sustainable linkages with the stakeholders of the institute.

Generally, to have strong collaboration among stakeholders, UIL should be done by involving students, staff, institutes,

and university officials and industries otherwise it will not be sustained. Giving the chances for industry CEOs to participate in university issues as a board member or being institute level committee member shall make the bureaucratic linkage relationships easy. Beyond this, the institute should give media coverage for finished and on-going projects that work with industries like a project with Abay Basin, Amhara Rural road authority, and so. It enables other industries confident enough that DMiT can contribute to industries. Regular identification of stakeholders and

thematic areas for long- and short-term linkages are important so that community service operations can be executed effectively. This makes industries open/volunteer to work cooperatively with industries. Addition to that, inviting at least one industry personnel during student's internship report/project presentation will make industries to see what industrial problem does students resolve and it helps to strengthen the linkage between universities and industries

Table 4.5. Perception of academics on promotional measures to UIL in DMiT

Support Services Needed for Strengthening Linkages with the Industries	RII	Rank	Important level
Conduct seminars, workshop, Conferences/events to network with industries/enterprises	0.897	1	High
Balanced relationship and commitments among stockholders	0.883	2	High
Encourage regular industrial visits by staff	0.882	3	High
Build mutual interest research/conduct need assessment for research	0.880	4	High
Providing enough fund for collaboration	0.873	5	High
Develop institutional strategic plan with productive sector focus	0.865	6	High
Training for staff in entrepreneurship skills	0.852	7	High
Training for middle and upper management in building external relations	0.827	8	High
Learning from institutions with a history of strong engagement in UIL	0.820	9	High
Involve staff from industry in teaching program	0.800	10	High
Establishment of common technology centers/science parks	0.796	11	High Medium
Make it obligatory for academics to undertake a certain amount of work with industry	0.732	12	High Medium

5. CONCLUSIONS AND RECOMMENDATIONS

5.1. CONCLUSIONS

The word 'Linkage' indicates mutual benefits between two or more entities or bodies. By far linkage of the DMiT with industries may experience some step forwards. However, the finding of this study shows, the linkage at the institute level is at its infant stage. So far the DMiT has progressed its linkage with industries in some aspect only, i.e. student internship and staff's externship. These linkages by their selves are not enough for sustainable collaborations. They have to be formalized through effective MOU with selected industries. Academicians should also have to conduct demand-driven and quality researches on the industries to gain industries' trust. Strong commitment and clear follow up at all leadership levels is necessary to narrow the gap and inclusion of linkage in annual action plane and allocation of the budget should be done to make linkage as part of organizational structures.

Concerning the determinants of UIL, lack of financial support, apathy among academic staff, fragmented research endeavors, and lack of marketable products. Moreover, Lack of motivation, weak availability of collaborative center, and time constraint of staff due to heavy teaching and administrative works are identified as the obstacles of UIL.

5.2. WAYS TO FORWARDING

The institute should reform the incentive mechanisms for the institute's academicians for those who are researchers and engaged in collaborative work with industries. This can be done by permitting research grants for industry-focused works and the institute should encourage the researchers to transfer their research output into projects thereby benefited to industries as well as the surrounding community.

Unnecessary documentation must be removed, and decisions should be more quickly made. The institute should create a formal agreement with various industries, i.e. memorandum understanding to strengthen the UIL. Since the institute has huge numbers of students in all three semesters throughout the year, it is mandatory having independent UIL office whos tasks will be only on linkages. Thus, the university/institute has to reform its incentive mechanism for researchers.

Beyond this. arranging various sensitizing and advertising programs, regular identification of thematic areas, inviting at least one industry personnel during staffs externships, research, and projects, student's internship report/project presentation which make industries to see what industrial problem does students resolve. It helps to strengthen the

linkage between institute and industries are important so that community service operations can be executed effectively. In addition to that, give chances to professional associations, sectoral/industrial association and figurative

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