

THE IMPACT OF WOOD PROCESSING FACTORIES ON COMMUNITY LIVELIHOODS IN DODOMA CITY, TANZANIA

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ABSTRACT

At global scale technology marks variance on impact of forest resources over livelihood of communities. The study assessed the impact of wood processing industry on livelihood at Zuzu in Dodoma City Tanzania. This was a case study design in nature which employed a qualitative approach. Data were collected through key informant interviews, documentary review, and focus group discussion using 30 participants. It was revealed that the development has varied impacts over livelihood of the locality and the nation in general. These involved potential positive impacts of the development including change of land use, agglomeration of economic activities, spread of Chinese and Kiswahili languages, export trade promotion, and employment creation. Others are negative impacts including solid waste generation, deforestation, HIV/AIDS, men's absenteeism at home for job, and accidents. The study concluded that the negative impacts can be mitigated and positive ones enhanced in order to promote the local and national livelihoods of communities. It was recommended that the effective implementation of management and monitoring components are important strategies for sustaining the project. Again, the use of railway transport for the project's raw materials from sources and markets in Tanzania is important. This could be complimented by road mode in areas of missing railway lines. There is also a need to adhere to the best practice and operating procedures in the management of the development according to the national and international frameworks and standards.

Key words: Impact, Livelihood, Wood processing.

1. INTRODUCTION

According to the United Nations (2018), about 60 per cent of the world's forests which is approximately 2.4 billion hectares are primarily or partially used for the production of wood and non-wood forest products. Over 60 per cent of the world's round wood production originates from just eight sources: these are Brazil, Canada, China, the European Union, India, Indonesia, Russia and the United States. About half of this is accounted for by wood fuel and half by industrial round wood. Further it is explained that most wood fuel is used in rural areas and in developing countries, for heating and cooking, usually on open fires or in simple cook stoves. Although data for wood fuel is less reliable than for other categories of round wood, estimates suggest that in 2016 Asia (39 per cent) and Africa (36 per cent) accounted for the bulk of global production. Most wood fuel is consumed in its country of production; very little is traded internationally (UN, 2018). Despite richness in global endowment of forest resources, particularly on wood products in many countries, their impacts on livelihood promotion among communities requires close look due to variability in influence. Literature provides that after China, German, and Italy, Vietnam is considered as the fourth biggest furniture-exporting developing country in the world (Maraseni *et al*, 2017). Likely, evidence of wood impact on livelihood indicates positive results on economic and social promotion in Vietnam (Huyen *et al*, 2019). However, the Vietnam's wood processing industry also faces many new challenges. These are caused by financial crises, the increasingly detailed division of labour in the international market, the decreased demand for wood processing industries in national and international markets, and the increased cost of labour in Vietnam (Huyen *et al*, 2019). In Pakistan, the development of wood processing industry has significantly alleviated poverty, increased the employment of mountain farmers, and has improved the social and economic development of mountainous areas (Zada *et al*, 2019).

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In Africa, Cameroon is endowed with a high forest potential covering 40 per cent of its 465000 km² land area. This represents 22 million hectares of dense and degraded forest, of which, 17.4 million are exploitable for timber. It is equally argued that forest industries in the country contribute significantly to industrial development, employment, and human welfare. It is the production base for a wide range of products including processed timber, plywood, veneer, furniture and sawn wood (Ntabe *et al*, 2009). In Tanzania according to FAO (2010), about 40 per cent of the Tanzania's 88 359 000 hectares total land area is covered by forests and woodlands that provide for wildlife habitat, unique natural ecosystems and biological diversity and water catchments amounting to 1.6 million hectares. Held *et al*, (2017), explain that the current forest plantation area in Tanzania (including small scale woodlots) is estimated to be 325,000 hectares, with the key species being pine (65%) and eucalyptus (20%). The balance is largely made up by Teak and Black Wattle. Timber demand is driven largely by the construction, furniture and paper sectors. Other sectors using wood are power transmission, using eucalyptus poles (a key market for STGs) and the transport sector consuming wood in the form of pallets and boxes (Ntabe *et al*, 2017).

The wood-based forest industry in Tanzania is dominated by sawmilling, furniture and other processed wood products (URT, 2014). Indufor (2011), indicates that the number of mills has increased from about 140 in 1998 to 367 registered in 2005. It is explained that most of these mills however are small-scale with annual log input not exceeding 5,000 m³ and employing about 5 to 8 persons. There are also pole treatment plants with total capacity of 350,000 annually while the production of wood based panels industries is fairly small with three factories only for plywood and block-board. The pulp and paper mills produce 40,000 tons of kraft paper annually for domestic and international markets (URT, 2014). The development of the wood processing industry will add value over livelihoods of the locality at Zuzu and the nation in general.

The operation phase of the development will have activities of processing soft wood products to semi-finished for housing commercially. It will employ human resources about 30 to run the operational activities. The project will process logs from soft wood pine species that are available in Tanzania into plywood for construction purpose (*Pinus patula*, *P. elliottii* and *P. caribaea*), cypress (mainly *Cupressus lusitanica*), eucalyptus and teak (*Tectona grandis*). The plywood will be made from various pine species available in Tanzania such as the southern pine.

The pine logs will be acquired from Iringa, Mbeya, Lindi, Morogoro and Njombe regions. These raw materials will be acquired from forest plantations owned by both government and the private sector by buying. The plant products out of the processing activities will include: Soft wood for construction purpose including: veneers (thin wood layers or plies) bonded with an Adhesive. The semi-finished softwood goods will be transported for local and international markets. The international markets for the plant products will include Arabic Countries, China, India and African Countries as well.

According to URT (2019), Dodoma region possesses prioritized areas of investment of which among others industrial development is part. The areas on industrial development in Dodoma involve: building and construction and house finishing and decorators among others. The large part of the region is occupied by Savanna type of vegetation with bush thickets, scattered grasslands and forests on hilly areas (URT, 2019). This indicates that the development will seek its raw materials for wood processing from other parts of Tanzania. The location of wood processing factory in Dodoma is linked to the Alfred Weber's industrial location theory that seeks to find a midpoint between location of industry and points to access raw materials, and markets of goods or services in order to reduce the costs. Dodoma region in this case is the midpoint or optimal location for wood processing industry because of its centrality in relation to local markets and raw materials sources in all parts of Tanzania. It is also located at least cost to export markets. However, the forests in Tanzania are faced with deforestation at a rate of between 130,000 and 500,000 ha per annum, which results from heavy pressure from agricultural expansion, livestock grazing, wild fires, over-exploitation and unsustainable utilization of wood resources and other human activities mainly in the general lands (FAO, 2010). This called for investigation of impact of the wood processing factory in attempt to promote any likely positive impacts associated with the

development and mitigate any likely negative impacts for livelihood sustainability. The objective of the study was therefore to assess the likely impacts of the project on livelihood of the community.

2. THEORETICAL AND EMPIRICAL FRAMEWORK

The industrial location theory by Alfred Weber proposes that the location of industries should be according to consideration of the three important factors. These involve the distance to and from sources of raw materials. This is important in order to reduce the cost incurred in the production process. The second factor is the place to access markets for the produced goods or services. This should be optimal to where an industry should be located. The third factor is the place to locate an industry. This should be optimal to raw materials and markets. The wood processing factory is relevant to this theory due to its location in Dodoma capital which is the central place to the places of raw materials in Iringa, Njombe and other places in Tanzania. It is also the growing market for wood product which is nearby the largest market in Tanzania, Dar es Salaam and close to international harbor of Dar salaam for export market. The development will therefore impact on the livelihood of communities in the locality and nationally. The analysis of policies, laws and strategies that are relevant to the project was done. The international treaties have also been reviewed as ratified by the government of Tanzania. Policies involved are the Construction Industry Policy 2005, National Investment Promotion Policy, 1996, National Employment Policy 2008, The Cultural Policy of 1997, The Mineral Policy of Tanzania 2009, The National Environmental Policy of 1997, The National Land Policy of 1996, The National Forest Policy, 1998, The National Population Policy, 2006, The National Energy Policy of 2003, The Human Settlement Development Policy of 2000, The National Water Policy, 2002, The National Health Policy, 2003, The National Strategy for Growth and Reduction of Poverty (NSGRP) 2005, The Tanzania Strategic Cities Project (TSCP) 2009, Small and Medium Enterprises (SMEs) Development Policy 2003.

Acts reviewed were: the Tanzania Investment Act of 1997, Environmental Management Act No. 20 of 2004, The Tanzania Trade Development Authority Act, 2009, The Mining Act 1998, The Mining Act 2010, The National Land Use Planning Commission Act No. 3 of 1984, The Land Act N0. 4 of 1999, The Occupation Health and Safety Act of 2003, Water Resources Management Act, 2009, The Water Supply and Sanitation Act, 2009, The Standards Act N0. 3 of 1975, The Surface and Marine Transport Regulatory Authority Act, 2001, The Occupational Health and Safety Act, 2003, The Dodoma Special Investment Area Act, 1989, The Energy and Water Utilities Regulatory Authority Act No. 11 of 2001, The Export Processing Zones Act No. 11 of 2002, Industrial and Consumer Chemicals (Management and Control) Act No. 3 of 2003

Regulations analyzed included: National Environmental Standards Compendium, 2001, The Environmental Impact Assessment and Audit Regulations, GN NO. 349 of 2005, The Forest Act N0. 14 of 2002. The relevant international treaties which Tanzania has ratified include: the 1977 Geneva Convention concerning the protection of workers against occupational hazards in the working environment due to air pollution, noise and vibration came into force in 1979, the 1991, Bamako Convention on the ban of the import in Africa and control of Trans boundary Movement and management of Hazardous wastes within Africa, the Basel Convention on control of Trans-boundary Movement of hazardous wastes and their disposal of 1989, the Vienna convention on the ozone layer prevention of 1985 and the United Nations Conventions on the elimination of all form of discrimination against women. The project activities relate to the conventions, hence need for observation and compliance.

3. METHODOLOGY

The study was done in Dodoma urban Tanzania. The region has no pine resources, this called the attention to assess its practicality and impacts associated with this development on livelihoods apart from legal requirement under Environmental Management Act of 2004 that requires this type of project to undertake environmental and social impact assessment study. Dodoma City is the growth industrial and city in Tanzania with many expectations on growth including industrial and peoples' livelihoods. It employed a case study design that adopted a qualitative approach. Purposive sampling method was important in realization of study participants who were: Ministry of Natural Resources and Tourism, Ministry of Industry and Trade, Tanzania Forest Services Authority (TFSA) Central Zone, Capital Development Authority (CDA), Dodoma Municipal Council (DMC) Dodoma Urban Water and Sewerage Authority (DUWASA), Zuzu Ward Executive Officer's Office and

Zuzu Village Executive Officer's Office, developer and Zuzu village Community. Various methods of data collection were used to produce results. These were observation through site visit. The site was visited in order to obtain the required information for the study. It included the direct observation of the site, gathering temporal and spatial features. The second method was key informant interview that was conducted through stakeholders' consultation process. These involved the above mentioned local and central government authorities. Focus group discussion was another method of data collection with 30 participants. This was used to obtain data regarding village community members of Zuzu village. Another method was documentary review, the relevant documents reviewed included the project documents as well as the relevant policy, legal and regulatory documents at national and international levels.

4. FINDINGS AND DISCUSSION

The results of interviews and focus group discussion revealed the following in relation to the existence of the project at Zuzu village and its impacts. It was found that the first issue was about rationale for plywood investment in Dodoma. It was argued that the government is committed to protection of the existing industries unless there is a gap that is not filled in by industries in Tanzania. This aids to avoid unnecessary competitions. The second issue was about energy consumption. The argument was that the government is strictly discouraging the use of wood resources to produce energy. Other sources of power/ energy like thermo, solar, wind and coal are encouraged. The energy to be produced by boilers must suitably find other utilities. The third issue was about reliability of raw materials. Regarding this it was observed that the developer must enter into contractual agreement with the ministry responsible for the supply in order to attain reliability in raw materials. Again the agreement to feed the local market first before export was considered important. The fourth issue was about scheme for tree planting. It was explained that the developer must establish her own plantation for future use of the project.

The fifth issue was that the project was supposed to be located closer to raw materials. It was argued that it could be too costly to locate in Dodoma. Stakeholders argued that the southern highlands was the better place for locating the project than Dodoma for the transportation factor. Again it was explained that the responsible ministry must conduct a site verification visit at project location in Dodoma. The sixth issue was about capacity of the proposed plant. This was considered important given the argued scarcity of pine resources in Tanzania. The seventh issue was on raw materials. It was argued that there was a need for detailed survey on availability of raw materials. It was explained that at that time there was no guarantee of the supply of pine from the government owned farms. Yet, it was further argued that most of the private sector plantations were not yet matured in the southern highlands like Kiwira, and Kawetile. The Sao Hill farm in Iringa had several customers. The central zone: Dodoma, Singida, and Manyara regions had no forest resources for wood processing. Again the game reserves and controlled areas are prohibited. The eighth issue concerned with sizes of wood products. For both local and export markets it was argued that sizes of products are important consideration as stipulated in the regulations of Tanzania. The ninth issue was permit for plant establishment. The proponent must seek a license to erect or operate a saw mill, where form Number FB 29 was applicable with evidences from the district, and regional authorities on where the raw materials will be acquired from.

The tenth issue was legal procedures. The developer was urged to adhere to all legal procedures related to project investment including laws, sectoral policies and permits. The eleventh issue was waste management. Stakeholders were concerned with the project's system to clean residues to be developed to avoid interference of streams. Stakeholders maintained that the remains of plywood must be converted to fertilizers for crops and gardening. The project must adopt the plan for zero waste management so that to put a system of recycling of all wastes. It was argued that the Dodoma Urban Water and Sewerage Authority (DUWASA) did not have systems for drinking and sewer in Zuzu village. Therefore, the developer was advised to have the waste water treatment pond. Water for the proposed project consumption was also considered as the necessary need.

The twelfth issue was about public acceptance. Public acceptance at all levels was seen as an important element for project sustainability. The thirteenth issue concerned with Zuzu industrial area. The area was formally dedicated for the Public Sector Reform Commission, then to Consolidated Holding Corporation and currently was given to the Treasurer Registrar. Therefore, the project proponent must hold legal documents for such

development at the area. The fourteenth issue was on air and land pollution from dusts and pieces of woods. The concern was how these will be managed. The fifteenth issue concerned about two industries on the same compound. There must be clear demarcation between the proposed projects on the site (the wood processing and slaughter house projects). The sixteenth issue was about project water use. It was advised that DUWASA can connect the project with water for consumption via the Itega hill water tank neighboring Zuzu village and project area.

The seventeenth issue was on land use change. The proposed project will be in the designated industrial estate. However, there was need to apply for change of land use since the former use was for tiles manufacturing plant. The eighteenth issue was compatibility of the project with the proposed slaughterhouse. The proposed project will use the same compound with the proposed slaughter house project. It was seen challenging on how to accommodate the two projects at the area. The nineteenth issue was nature and kinds of products for export market. The exportation of logs outside Tanzania is strictly prohibited. The twentieth issue was impact of logs transport from sources to Zuzu village. The project must follow the existing procedures for transportation. The twenty first issue was supply of logs from intended sources. The project promoter must be sure of the reliability and sustainability of the sources. The twenty second issue of concern was likely impact of theft from forest resources of the central zone for sale at the project. The evidence was given by stakeholders that an experience from the costal forest resources when such establishment is done, has resulted into illegal harvesting of forest resources. The twenty third issue was employment generation. The project was introduced to the village office. It will contribute on employment opportunity. Participation on employment for project was thought to consider village community first to get employed. The twenty fourth issue was on chemicals to treat woods. Treatment was considered so challenging due to toxicity and chemical compositions. The twenty fifth issue was availability of water. It was requested that the developer should connect the village community to water resource access.

The developer's responses on stakeholders' issues and concerns had been presented in this section. The promoting company had already started addressing the issues raised by various stakeholders for the project development. Regarding the issue of change of land use, the proponent had consulted the former Capital Development Authority (CDA) in order to seek requirements for permission of change of land use of the site. On legal site documents and requirements for soft woods mill operation, the developer was prepared to consult the relevant authorities for acquisition of permits to operate the industry. These included the Ministry of Natural Resources and Tourism, district and regional authorities where the raw material of soft wood will be availed in Iringa, Njombe, Morogoro, Mbeya and Lindi regions. It was explained that the site was acquired by S and Y Wood Products Company Limited from the Land Lord of the site by rent. Regarding the compatibility of wood industry to the adjacent slaughter house project the developing company had acquired the industrial compound that will have the capacity to accommodate the two industries. Each industry will be enclosed such that there will be no leakages of wastes from one plant to the other. The company again would liaise with the former CDA for guidance on how to fit the two proposed projects into the compound. On wastes management issue, the project will have a good system of managing wastes including use of dust absorbing tank, pieces of wood to be disposed in the boiler, electrified filter beds (EFBs), wet electrostatic precipitators (WESPs), and oxidation systems (ie. recycling of boiler water and purification of soot by filter). Refereeing to issue of community benefits, the company had agreed with the village community to install water infrastructure for supply of water needed by cattle and human consumption from the borehole. Again it was explained that the project would employ about thirty people in the operation phase.

4. 1 Impacts

This section identifies the impacts as presented in Table 1 and Table 2 for the positive and negative impacts respectively. The section further identifies the duration, significance, intensity and coverage of impact, enhancement that relate to the development.

Table 1: Positive Impacts Assessed

| S/N | Impacts | IN | L | DR | C | I | Significance rating | |
|-----|--|-----|---|-----|---|---|---------------------|------|
| | | | | | | | -MM | WMM |
| 1 | Change of land use | Ve+ | D | LTD | L | H | High | Low |
| 2 | Increase in population growth | Ve+ | D | LTD | N | H | Low | Low |
| 3 | Interbreeding among the village community and project workers | Ve+ | D | LTD | L | H | Low | Low |
| 4 | Promotion of rural livelihoods to business groups | Ve+ | D | LTD | N | H | Low | High |
| 5 | Contribution to growth of urbanism in Dodoma, Zuzu village | Ve+ | D | LTD | N | H | Low | High |
| 6 | Enhanced growth of housing and construction industry | Ve+ | D | LTD | N | H | Low | High |
| 7 | Employment creation during both construction and operation phases | Ve+ | D | LTD | N | H | Low | High |
| 8 | Contribution to export trade | Ve+ | D | LTD | N | L | Low | High |
| 9 | Cultural influence | Ve+ | D | LTI | N | L | High | Low |
| 10 | Agglomeration of business activities at the project site and village | Ve+ | D | LTI | L | H | high | Low |
| 11 | Contribution to Dodoma capital industrial development | Ve+ | D | LTI | N | H | Low | High |
| 12 | Contribution to rural peoples' livelihoods | Ve+ | D | LTI | N | H | Low | High |
| 13 | Enhanced family ties | Ve+ | P | LTI | L | L | Low | High |
| 14 | Reduced incidences of offences | Ve+ | P | LTI | L | L | Low | High |
| 15 | Enhanced security from redevelopment of project site | Ve+ | P | LTI | L | L | Low | High |
| 16 | Increased use of locally produced wood products | Ve+ | P | LTI | N | L | Low | High |
| 17 | Contribution to local and central government taxes | Ve+ | D | LTD | N | H | Low | High |
| 18 | Enhanced maintenance and management of feeder road connecting to the project | Ve+ | D | LTI | L | H | Low | High |
| 19 | Enhanced health security for potential workers | Ve+ | D | LTI | L | H | Low | High |
| 20 | Spread and development of Chinese, English and Kiswahili languages | Ve+ | D | LTI | T | H | Low | High |
| 21 | Interbreeding | Ve+ | D | LTI | T | L | High | Low |
| 22 | Enhanced development cooperation between China and Tanzania | Ve+ | D | LTI | T | H | Low | High |
| 23 | Reduced men's absenteeism from their families for job search | Ve | D | LTI | L | H | Low | High |

Note: IN stands for Impact Nature, D for Definite, DR for Duration, C for coverage, I for Intensity, -MM for without mitigation measures, WMM for with mitigation measures, P for Probable, LTD for Long term direct impact, LTI for Long term indirect impact, STD for Short-term direct impact, V- for Negative impact, L for local, N for National and T for International.

Table 2: Negative Impacts

| S/N | Impacts | IN | L | DR | C | I | Significance rating | |
|-----|---|-----|---|-----|---------------|------|---------------------|-----|
| | | | | | | | -MM | WMM |
| 1 | Sound and noise pollution | Ve- | D | LTD | Local | Low | High | Low |
| 2 | Liquid waste pollution | Ve- | D | LTI | Local | Low | Low | Low |
| 3 | Solid waste generation | Ve- | D | LTD | National | High | High | Low |
| 4 | Water pollution | Ve- | D | LTI | National | Low | High | Low |
| 5 | Contributing to land degradation on construction materials | Ve- | D | STD | Local | Low | High | Low |
| 6 | Contribution to deforestation resulting from the need for building timber and woods | Ve- | D | LTD | National | High | High | Low |
| 7 | Likely occurrence of accidents during construction and operation phases | Ve- | P | LTD | National | Low | High | Low |
| 8 | Unemployment at decommissioning phase | Ve- | D | STD | Local | Low | High | Low |
| 9 | Leaving the plot land unutilized | Ve- | D | STD | Local | Low | High | Low |
| 10 | Air pollution | Ve- | D | LTD | Local | High | High | Low |
| 11 | Fire outbreak | Ve- | P | STD | Local | High | High | Low |
| 12 | Contribution to desertification | Ve- | D | LTD | National | High | High | Low |
| 13 | Contribution to forest species reduction | Ve- | D | LTD | National | High | High | Low |
| 14 | Promotion of forest resources commercial theft | Ve- | P | LTI | National | Low | High | Low |
| 15 | Spread of HIV/AIDS | Ve- | D | LTI | International | Low | High | Low |

Note: IN stands for Impact Nature, D for Definite, DR for Duration, C for coverage, I for Intensity, -MM for without mitigation measures, WMM for with mitigation measures, P for Probable, LTD for Long term direct impact, LTI for Long term indirect impact, STD for Short-term direct impact, and V- for Negative impact.

4.2 Discussion

The study examined impacts of the wood processing factory over livelihood. There are many positive impacts as well as negative impact associated. The positive impacts have more weights compared to the negative impacts which can be mitigated. The developer was examined and found that had commitment to the management of environmental impacts and issues of the development. The development will employ personnel for managing the environmental issues. Among employees, there will be the responsible personnel for project environmental issues including the management of enhancement and mitigation measures of the project. Monitoring component for environmental issues will be implemented in order to track the development of the management of mitigation measures. Management of the infrastructure of the building will include: drinking water, storm, sewerage system facilities, firefighting system, car park and community relations relating to project operations. The developer through its staff will oversee the implementation of environmental management and monitoring and submit monitoring report annually to relevant authorities including Dodoma Municipal Council and National Environment Management Council (NEMC). The environmental audits of the project will follow this study after every three years to confirm the compliance of management of the proposed mitigation measures.

According to the Tanzania Environmental Impact Assessment regulations, 2005 section 50-(1), after the environmental impact statement has been approved by the Minister, or after the initial audit of an ongoing project, the proponent shall take all practical measures to ensure the implementation of the environmental management plan by: carrying out self-auditing annually and preparing an environmental audit report after each audit and submitting the report to NEMC annually. The study recommends that the consultant should be hired to undertake environmental audit as per EIA and Audit regulations, 2005 of Tanzania. The developer had been examined and found that the proposed management did not have the unit to promote the management of environmental mitigation measures. It was therefore, recommended that the following units were key to be formed followed by recruitment of the relevant personnel: Environmental, Health and safety personnel. This will enable the overseeing of all operation processes involving workers, project physical environment and surrounding community. The relevant personnel here will be the Environmental Officer who will be responsible for community relations Liaoning, and education, wastes management and monitoring of environmental and social parameters of Environmental and Social Management Plan (ESMP) and Environmental Monitoring Plan.

Furthermore, the research, monitoring and compliance unit was proposed. The unit would be responsible for undertaking research on management of pine forest plantation to be established for the project. It would also conduct monitoring of project processes and assessment of the wood processing compliance to relevant policies, guideline, regulation, standards and laws in operation phase. The study saw the need for training about the development. The project proponent required clear familiarization with the impacts, mitigation and enhancement measures and the way the ESMP and monitoring plan would be implemented. Therefore, it is imperative that the workers, surrounding community, project management and contractors in all project phases be educated on the results of the study.

The proposed development will avail pine forest from southern highland regions. It will establish a storage yard for raw materials from source regions at project site. The by-products of the processes would be plywood which would be shed with glue only. The plywood was intended for local and export market in construction and housing. The project would import various processing machines including the wood cutting machine, compressing machine, standardizing machine, and coating machine. These machines would use coal and superglue. Regarding safety issues, the human resource involved in the plant will be protected with protective gears such helmets, uniforms, and masks. The plant will have a zero waste management mechanism whereby the liquid wastes will be recycled after and water be reused in the coal run boiler. Regarding safety issues, the human resource involved in the plant will be protected with protective gears such helmets, uniforms, and masks. The plant will have a zero waste management mechanism where the liquid wastes will be recycled after and water be reused in the coal run boiler. The practices of health however must be linked to the direction of the Occupation Health and Safety Act of 2003.

The local community does not depend directly on pine natural resources at Zuzu area. This is because there are no pine species in the nearby Zuzu village. However in the source regions in Njombe, Iringa Mbeya and Morogoro regions, communities have created needs. These needs are based on construction of housing. In this way the project will promote such needs by making easy plywood products available in Tanzanian communities to satisfy their needs.

On water resources, the project site is well endowed with underground water resource. The development must adhere to the requirements of the National Water Policy of 2002, Water Resources Management Act, 2009, and the Water Supply and Sanitation Act of 2009. The surrounding community had historically known to be users of the currently defunct borehole located at the project area. As the matter of concern to the importance given to water resources the developer was found willing to renovate the borehole for project purpose, and as well give opportunity to the local community surrounding the project at Zuzu village to tap water for household and cattle consumption.

The project land area is located in Zuzu village. According to the legal framework of Tanzania, the project site had been designated to as an industrial estate by the former CDA which was mandated for land use planning and management in the Capital City of Dodoma. The village authority had the co-management role to the site as it belongs to its jurisdiction. There is no human settlement on this site, nor any human activity done despite it being abandoned for a long period of time.

Pine forests in Tanzania is sparsely distributed, being more restricted to the southern highlands plantation in Iringa, Njombe, Mbeya and Morogoro regions. However, the project had planned to establish her own plantation in Iringa as the complementary source to the government and private sector sources mentioned. The project will have the capacity of processing of about 5000 cubic metres of plywood annually. This capacity can only withstand when there is proper management of the forest among plantation owners. The raw materials will be transported by both road and railway modes of transport. These modes will complement the environmental and project costs of availing raw materials to the site. The railway means is the more suitable because it will avoid congestion and road damage. However, the roads transportation when opted must observe the road requirement referring to tonnage, and speed among others as stipulated by various legal, regulatory and policy requirements of Tanzania.

Analytically the development has the costs and benefits as well. The costs for the project could be mitigated to allow the flourishing of the benefits. This would be done by adopting an effective implantation of environmental and social management plan and monitoring plan for the project. The Standards Act NO. 3 of 1975 must be observed in the operation of the development. Again, effective supervision of the decommissioning plan when the project comes to an end. It considers important aspects of planning and management in time of decommissioning phase, including building infrastructure, unemployment and land issue. When the project comes to an end as the result of any factor, such as need to change the project, the decommissioning plan should be prepared to serve the purpose of closure of the project. This should be approved by the relevant authorities. The decommissioning phase will involve the demolishing of the sites' built structures and leveling activities to leave the land open for other utilities. The project will handle human resources unemployment issues by responding to forced retirement that is in accordance with the Tanzania laws. The National Land Use Planning Commission Act No. 3 of 1984, The Land Act NO. 4 of 1999 are among the central tools important in this phase of the project. Environmental procedures for auditing in this phase will be part and parcel of the exit strategies of the project by the developer.

5. CONCLUSIONS

The section gives the conclusion of the study. The study was sought to assess the impacts of wood processing factory on livelihood at Zuzu village in Dodoma City. It was found that there are positive impacts that will accelerate livelihood promotion among communities. These involve employment generation, contribution to export trade, increased urban-rural commuters, agglomeration of economic activities, revenue generation, and growth of urbanism among others. There are negative impacts that require mitigations in order to capture livelihood promotion of the locality. These involve land degradation, HIV/AIDS spread, fire outbreak,

deforestation, and accidents to mention but a few. It was found that implementation of effective environmental and social management and monitoring plan will be promote further the attainment of peoples' livelihoods. Therefore it was concluded that there are positive and negative impacts of the development on the locality and the nation on livelihood that require enhancement and mitigation respectively.

6. RECOMMENDATIONS

It was recommended that the effective implementation of management and monitoring plans are important for the economic, social and ecological dimensions of the project. The sources of raw materials for the project will require periodic monitoring. Again the study recommends for use of railway mode of transport for availing the project's raw materials from sources and markets in Tanzania. This will be complimented by road mode in areas of missing railway lines. Moreover, the periodic environmental audit is the necessary requirement for sustaining the project. On ensuring sustainable acquisition of raw materials for the project, the study recommends for the establishment by the developer of the forest farm for future supply of raw materials. Again research should be done to examine the sustainability of pine forest in the source regions to determine the rate of use by different stakeholders.

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