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Highlights

Profitability and Constraints

Factors Affecting Early Marriage

Discovering Thoughts, Inventing Future

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Factors Affecting Early Marriage in Bangladesh

By Md. Rasel Kabir, Masudul Islam, Md. Salauddin Khan & Raju Roy
Khulna University, Bangladesh

Abstract- This study based on BDHS-2007 data of 10,996 ever married women presents the current scenario of female age at marriage in Bangladesh and its noteworthy impact on fertility as epoch at first marriage has a chief upshot on childbearing as women who get married before time contain, on an average, a longer era of disclosure to the risk of fetching pregnant and a superior figure of lifetimes birth. Logistic regression model was conceded to this cram with the effects of the allied explanatory variables tested by chi-square test on early matrimony. Respondents' work status, education level, religion, wealth index and partners' educational level drastically guessed the early marriage. Women from the rural area be located to acquire married 1.50 period more anticipated than the women from inner-city.

Keywords: *early marriage, logistic regression, bangladesh.*

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Factors Affecting Early Marriage in Bangladesh

Md. Rasel Kabir [α], Masudul Islam [σ], Md. Salauddin Khan [ρ] & Raju Roy [ω]

Abstract- This study based on BDHS-2007 data of 10,996 ever married women presents the current scenario of female age at marriage in Bangladesh and its noteworthy impact on fertility as epoch at first marriage has a chief upshot on childbearing as women who get married before time contain, on an average, a longer era of disclosure to the risk of fetching pregnant and a superior figure of lifetimes birth. Logistic regression model was conceded to this cram with the effects of the allied explanatory variables tested by chi-square test on early matrimony. Respondents' work status, education level, religion, wealth index and partners' educational level drastically guessed the early marriage. Women from the rural area be located to acquire married 1.50 period more anticipated than the women from inner-city.

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I. Introduction

Wedding ceremony in Bangladesh symbols the peak in a woman's life when childbearing becomes up to standard. Marriage takes place early for women in Bangladesh: among 20-49 age of women, 78 percent are wedded by age 18 and 88 percent are wedded by age 20. Among men age 20-49, only 5 percent are connubial by age 18 and 15 percent by age 20[17]. In the 25-29 age cohorts, for example, three-fourth of women are married by age 18 and 95 percent by age 25[3]. In a state like Bangladesh along with the enlarged control of marital fertility, it is also important to inquire into the age at marriage in any assessment of the concern of dropping fertility [17]. This paper will seek to verify various foremost factor linked with early age at marriage in Bangladesh.

The large population of Bangladesh, which is continuing to enlarge at a quick rate, is a foremost barrier to societal and profitable progress in the state. Sivaram, independently Richard and Rao (1995) studied the determinant of early marriage among rural and urban females of South India. The multivariate analysis showed brides' education to be related to early age at marriage of females in both the areas [15]. Choe, Thapa and Mishra (2004, p.4) showed in study in Nepal, education along with parental education has a decidedly main consequence on early marriage. The study showed that achieveing the level of education boosts ages at first marriage.

According to Chojnacka (1995), non-traditional and non-agricultural employment of young women favours later marriage. Chojnacka (1995) mentioned the findings of WFS data for the end of the 1970's and 1980,s in this regard, which showed age at first marriage to be higher among employed in modern and transitional occupations than in traditional or unspecified ones[7]. Hirschman (1985) gave two possible clarifications for the causal liaison between women's premarital work experience and their age at marriage [5].

Age at first marriage in the middle of women inhalation in metropolitan in general found to be upper than those breathing in countryside. Yang (1990) documented that female age at primary matrimony in China had been increasing considering the year 1980s, and accelerated after 1972 following the implementation of the family planning policy. Minh (1997) observed that females born in metropolitan areas of Vietnam got married on average 1.3 years shortly than individuals who were born in countryside [17]. Exposure to mass media may have a significant effect on female age at marriage as well (Savitridana 1997) [21].

II. Data and Methods

a) Data source

This study utilized the facts commencing Bangladesh Demographic and Health Survey (BDHS) 2007. The Demographic and Health Survey (BDHS) program is an imperative resource of information regarding health other related issues in Third world countries[1]. The 2007 BDHS employs a on a national scale envoy sample that wraps the entire population residing in personal dwelling units in Bangladesh. The core intention of the survey were to endow with advanced information on fertility and childhood mortality levels fertility penchants; awareness, approval, and apply of family arrangement methods. All ever-married women 15-49 who naped in the preferred domestic the night before the analysis were adequate for the survey. Still the amount of ever –married women age 10-14 was very low, and thus this group had to be debarred from the study. The study was designed to fabricate spokesperson estimates for the majority of the indicators for the country as a whole, for the town and the rustic areas independently, and for each of the six divisions.

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The 2007 BDHS is a nationally representative of 10,996 women age 15-49 and 3,771 men age 15-54 from 10,400 households covering 361 sample points (clusters) throughout Bangladesh, 134 in urban areas and 227 in the rural areas[19]. This survey is the fifth in a sequence of national-level population and health surveys carryed out as part of the global Demographic and Health Surveys(DHS) program.

b) Sample Design

The sampling frame used for BDHS 2007 was the population census of the People's Republic of Bangladesh conducted in 2001 (PCPRB, 2001), provided by the Bangladesh Bureau of Statistics (BBS). The sampling frame was comprised of 259,532 enumeration areas (EAs) created for the 2001 census[18]. The sample for BDHS 2007 was a stratified sample, selected in two periods from the 2001 census frame. Stratification was achieved by separating each division into municipal and rustic areas. Administratively, Bangladesh was alienated into six divisions. In turn, each division is divided into Zillas; each Zilla is divided into Thana; In rural areas; each Thana is divided into Unions; each Union to mouzas. Urban areas in an upazilla are wards, and wards are subdivided into mahallas. An EA, which includes of about 100 households, on average, is correspondent to a mauza in rustic areas and to a mohallah in inner-city areas. The 361 Primary Sampling Units (PSUs) preferred in the earliest stage of sampling included 227 countryside PSUs and 134 inner-city PSUs. The lists of households were used as the sampling frame for the selection of households in the second stage of sampling.

c) Data Processing

All questionnaires for the BDHS were periodically returned to Dhaka for data processing at Mitra and Associates. The dealing out of the data composed began curtly after the fieldwork originated. The processing operation consisted of workplace editing, coding of open-ended questions, data ingress, and editing inconsistencies initiated by the computer programs. The information were processed on six microcomputers working in double shifts and conceded out by 10 data access operators and two data entry controllers. The synchronized dispensation of the data was an advantage since the quality control teams were capable to recommend field teams of problems detected during the data entry. In particular, tables were generated to check various data quality parameters. Data processing commenced on April 16 and ended on August 31, 2007[1].

d) Variables and Statistical Technique

The linear logistic regression method was applied to find out the net belongings of diverse determinant of early marriage more precisely. Variables used as dependent and independent in the investigation. All these variables with their original codes cannot be used in this training; some of them are recoded in relation to their necessity for the study. The selected demographic and socio-economic variables, which we used in this paper, are briefly described here.

Age at first marriage was used as the dependent variable, which was recorded in single years. The reliant variable was made dichotomous by dividing it into two groups: those who married before reaching of 18, were considered as early married and who were married at or after age 18, were considered as late married. Eighteen years was selected as the cut off position for defining the position of marriage as this is the legal female age at marriage in Bangladesh. For logical reasons, women married untimely were carefully planned as the 'successes' and coded as 1. Late married women, conversely, were measured as 'failures' and were coded as 0.

Variables, illustrated major alliance with age at marriage in chi-square tests were selected as explanatory variables. Respondents' work status, their education level, creed, region of dwelling, partners' educational level, wealth index were measured as explanatory variables. Exposure to the media of the respondent was finally excluded from the ultimate scrutiny as it was found to have an insignificant impact on early marriage in bivariate chi-square test.

III. Results

Basic information of the respondents' age at first marriage with some essestial variable is listed in table1. This investigation confirmed that the early marriage is highest (21.4%) in Dhaka.

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Table 1 : The distribution of respondents by age at first marriage and other variables

Variables and their categories	Age at first marriage Late married (%)	Early married (%)	Total (%)
Division			
Barisal	11.2	13.3	13.1
Chittagong	18.6	17.5	17.7
Dhaka	20.4	21.4	21.3
Khulna	12.9	15.9	15.6
Rajshahi	16.0	19.3	18.9
Sylhet	20.9	12.5	13.5
Respondent education			
No education	23.9	57.1	53.0
Primary	29.4	33.4	32.9
Secondary	8.7	6.0	6.3
Higher	38	3.6	7.8
Husband,s education			
No education			
Primary	14.0	35.4	32.8
Secondary	14.6	27.9	26.2
Higher	27.8	26.2	26.4
	43.6	10.5	14.6
Media			
No	28.9	53.4	50.6
yes	71.1	46.6	49.4
Place of residence			
Rural	41.3	65.2	62.2
Urban	58.7	34.8	37.8
Religion			
Muslim	83.9	91.2	90.3
Nonmuslim	16.1	8.8	9.7
Wealth index			
Poor	14.4	37.1	34.3
Middle	30.4	40.3	39.1
rich	55.2	22.6	26.6
Respondent's Work status			
Unemployed	71.1	67.6	68.0
Agriculture/poultry/home			
Labour	8.1	17.9	16.7
Business/	10.9	11.6	11.5
professional	9.8	2.9	3.8

division and the lowest (12.3%) in Sylhet. There was considerable differentiability in percentage of early marriage in the context of respondents' education level. Women with no education exposed the highest (57.1 %) percentage to get married as early as quickly whereas that percentage (3.6%) for higher educated women was ignorable. The output of our study strongly supported the common phenomenon that the women living in rural (65.2%) area get married soon. Being most of the people living in Bangladesh Muslims, it was usual to have a larger portion from that religion group in the sample but the analysis presented the remarkable portion (91.2%) of occurring early marriage in Muslim people comparing with non-muslim groups. Women categorized as middle class based on the measurement of wealth index, unemployed were found to have early marriage with a far crying difference of percentage from their particular variables grouping. Women who were economically solvent, who were in different profession were found to report for getting married after 18 years old at a soaring entitlement.

Bivariate analysis suggested that a considerable involvement ($\chi^2 = 82.62, \mathrm{df} = 5, \mathrm{p} < 0.05$) between division from where the sample was drawn and dichotomous variable of age at first marriage. Respondents' education level, a very important variable

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significantly impacted on this dichotomous variable ($\chi^2 = 2.06E3, df = 3, p < 0.05$). In bivariate analysis, the other variables media, place of the residence, Partner's teaching, creed, wealth indicator, respondents working status appeared to be influential impact on early marriage because of having large chi-square standards and $p<0.05$ for every cases.

In identifying explanatory variables for insertion in the logistic regression, 8 variables were considered, namely division, respondents' work status, education level, religion, wealth index, partners' educational level, expose to media and their residential place.

These variables were initially tested via chi-square test with binary categorized variable of age at first marriage like the dependent variable. Only those showing significance were integrated in the initial logistic model. All variables included in the model are categorical. The model retained seven variables, including division, respondents' work status, education level, religion, wealth index, partners' educational level and their residential place as significant variable with results descripted in Table 2.

Table 2 : Initial binary logistic Regression model with all selected independent Variables

Predictors	Coefficient B	p	Odds ratio
Division			
Barisal	1.258	.000	3.518
Chittagong	0.826	.000	2.285
Dhaka	1.059	.000	2.883
Khulna	1.405	.000	4.076
Rajshahi	1.359	.000	3.892
Sylhet *			
Respondent Education			
No education	2.547	.000	12.79
Primary	2.077	.000	7.980
Secondary	1.565	.000	4.783
Higher *			
Husband's Education			
No education	.731	.000	2.078
Primary	.680	.000	1.974
Secondary	.337	.002	1.401
Higher*			
Media			
No			
Yes *	.018	.853	1.018
Region			
Rural			
Urban *	.403	.000	1.496
Religion			
Muslims			
Non Muslims *	.852	.000	2.343
Wealth index			
Poor			
Middle	.438	.002	1.549
Rich *	.305	.002	1.356
Respondents Occupation			
Unemployed	.473	.002	1.605
Agriculture / Home / Poultry			
Labour	.398	.033	1.490
Profession*	.341	.057	1.407

***** *Reference category*

Table 2 reports B coefficients and odds ratios for the variables retained in the initial model, with residential place of the respondents proving to be particularly significant in predicting early marriage on the part of participants. Women living in the rustic area were 1.49 times apt marry before reaching 18 as those breathing in inner-city area. Respondents who attained primary, secondary and higher level of education were found to get married early12.79, 7.980, 4.783 times more liable than the women who had no education.

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Participants working status significantly predicted their age at initial marriage. Professional candidates showed less interest where unemployed women were studied as one and half times (1.60) more than the category preceded before.

Since media appeared as an irrelevant variable in the initial logistic regression, another model retaining all variables but media was conducted to observe if there was any momentous distinction connecting these models and the result from this reduced model, intended in table-3.

Table 3 : Reduced logistic regression model

Predictors	B	P	Odds ratio
Division			
Barisal	1.303	0.000	3.680
Chittagong	0.883	0.000	2.418
Dhaka	1.088	0.000	2.967
Khulna	1.392	0.000	4.024
Rajshahi	1.357	0.000	3.884
Sylhet*			
Respondents' Education level			
No education			
Primary	2.550	0.000	12.802
Secondary	2.077	0.000	7.978
Higher *	1.634	0.000	5.126
Husband Education level			
No education			
Primary	0.743	0.000	2.102
Secondary	0.717	0.000	2.047
Higher *	0.338	0.001	1.402
Region			
Rural	0.367	0.000	1.443
Urban *			
Religion			
Muslim	0.755	0.000	2.128
Nonmuslim*			
Wealth Index			
Poor	0.421	0.000	1.524
Middle	0.246	0.006	1.278
Rich *			
Respondents Occupation			
Unemployed	0.409	0.005	1.505
Agriculture/home/poltry	0.390	0.029	1.476
Labour			
Professional*	0.327	0.057	1.387

** Reference category*

With a view to selecting a best model to predict early marriage well, Forward stepwise Logistic Regression and Backward Stepwise Logistic regression were incorporated in this analysis. Both approaches supported the reduced logistic regression by eliminating the insignificant variable (media) in their final iteration.

IV. Conclusions

The first major objective of the study is to investigate the impact of the determinants on the early female age at first marriage. Among all independent characteristics education plays a fundamental role on age at first marriage. This study proved that higher educated women have lower risk of early marriage than lower educated women. Like respondent's education, husband's education has similar effects on age at first marriage. Hence education is being the prime catalyst in this process because increase in educational attainment is likely to significant effect on age at first marriage. Religion has also positive effect on early marriage. Among Muslim percentage of early marriage is highest and lowest among the non Muslim. There are six different divisions (district of respondent's) in Bangladesh in. The behavior manners and cultures are more or less dissimilar in the divisions and hence age at first marriage is unlike. From the analysis we see that highest percentage of early marriage in Khulna region and closely later location Rajshahi region. One of the

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important reasons of high percentage of early marriage in Rajshahi and Khulna division is that the literacy rate in both regions is relatively lower. On the other hand, the lowest percentage of early marriage is in Sylhet division and the second lowest is in Chittagong division. Here it is concluded that the economic status of the population lived in Sylhet and Chittagong division. Although Dhaka is the capital of Bangladesh the percentage of early marriage is higher than Sylhet and Chittagong division. One of the vital points of this situation that there are many slum areas in Dhaka city, teenage marriage much more higher within the slum females, which severally affects the age at first marriage of the women of Dhaka division. Economic status is also an important determinant of early marriage. Percentage of early marriage is highest among the poorest and lowest among the richest.

References Références Referencias

1. Bangladesh Demographic and Health Survey. 2007; National Institute of Population Research and Training (NIPORT) Dhaka, Bangladesh; Mitra and Associates, Dhaka, Bangladesh; ORC Macro, Calverton, Maryland USA.
2. Bangladesh, Unlocking the Potential, National Strategy for Accelerated Poverty Reduction.2005; General economic division, Planning Commission, Government of people's Republic of Bangladesh.
3. Bangladesh: Strategy for Sustained Growth, Bangladesh Development Series, 2007; 18, The World Bank Office, Dhaka.
4. Cagatay N.1998. Gender and Poverty. Social Development and Poverty Elimination Division. United Nations Development Programme.
5. Hirschman, C. 1985. "Premarital Socioeconomic Roles and The Timing of Family Formation: A comparative Study of Five Asian Socities", Demography, 22(1):35-38.
6. Caldwell, J.C., Reddy, P.H. and Caldwell, P. 1983. "The Causes of Marriage Change in South India", Population Studies, 37: 343-361.
7. Chojnacks, H. 1995, The Role of Nuptiality in The Demographic Transition. The Case of Africa: A Conceptual Essay, Genus LI (3-4):117-150.
8. Ahmed, M., S. R. Nath and K.S. Ahmed. 2003. Education Watch 2002,literacy in Bangladesh need for a new vision overview of main report(Campaign for Population Education).
9. Begum, L., 2003. Meaning given to adolescent's reproductive health in Bangladesh. J.Popul.,9(1):82-103.
10. Central Intelligence Agency, 2007.The World Fact Book:Demographics of Bangladesh.
11. Islam, M.M. and M. Mahmud 1996. Marriage patterns and some issues related to adolescent marriage in Bangladesh. Asia-Pasific Popul. J., 11(3):27-42.
12. Mitra, S.N., A. A. Sabir, T. Saha and S. Kumar,2001. Bangladesh demographic and health survey 1999-2000. National Institute of Population Research and Training (NIPORT), Mitra and Associates, Dhaka; ORC Macro; Calverton, USA.
13. David W. Hosmer, S. Lameshow,1989. Applied Logistic Regression (New York: John Wiley and Sons).
14. Davis L. 1979. Beginning Population studies Demography Teaching Notes No.2. Canberra: Development Studies Centre, Australian National University.
15. M. Sivaram, J. Richard & P. S. S. Rao, 1995. "Early marriage among rural and urban females of South India", *Journal of Biosocial Science* , 27 (3):325-3.
16. Yang, Q.1990. "Age at first marriage and fertility in rural Anhui, China", *Journal of Biosocial Science* 22 (2):143-157.
17. Minh NH. 1997. "Age at first marriage in Vietnam: patterns and determinants", Asia-Pacific Population Journal, 12:49-73.
18. Rahman MS, Mondal MNI, Islam MR, Rahman MM, Houqe MN, AlamMS.2015. "Determinant factors of tobacco use among ever-married men in Bangladesh", Journal of Drug, Healthcare and Patient Safety, 7:77-85.
19. S.M. Mostofa Kamal. 2012. "Adolescent motherhood in Bangladesh: Evidence from 2007BDHS data", Canadian studies in population,39(1):63-82.
20. http://www.amicaall.org/tan/publications.
21. http://www.unicef.org/specialsession/how

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Profitability and Constraints of Three Major Fisheries Enterprises in Kano State, Nigeria

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Abstract- The study focused on the socio economic and profitability of major fisheries enterprises in Kano State, Nigeria. The socio-economic characteristics of the stake holders along the fisheries enterprises and profitability were described. It also identified and described the marketing channel of fresh and smoked fish in the study area. Gross margin analysis to assess the profitability of the business was determined. The constraints were also described and the factors that influence customer preferences in the study area identified. Primary data were collected from 30 fishermen, 30 processors and 20 consumers using questionnaire and analyzed statistically. The result of the study showed that male dominated fishing (52.3%), while female processing (47.5%). The gross margin analysis showed profitability values of N 74,350 for fishermen during raining period.

Keywords: *profitability, constraints, enterprises, kano state, fishery.*

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Profitability and Constraints of Three Major Fisheries Enterprises in Kano State, Nigeria

M. A. Dambatta [α], O. A. Sogbesan [σ], A. A Tafida [ρ], M. A Haruna [ω] & A. U. Fagge [¥]

Abstract- The study focused on the socio economic and profitability of major fisheries enterprises in Kano State, Nigeria. The socio-economic characteristics of the stake holders along the fisheries enterprises and profitability were described. It also identified and described the marketing channel of fresh and smoked fish in the study area. Gross margin analysis to assess the profitability of the business was determined. The constraints were also described and the factors that influence customer preferences in the study area identified. Primary data were collected from 30 fishermen, 30 processors and 20 consumers using questionnaire and analyzed statistically. The result of the study showed that male dominated fishing (52.3%), while female processing (47.5%). The gross margin analysis showed profitability values of ₦ 74,350 for fishermen during raining period. The constraints of the fishermen were dividing of the dam, high cost of fishing goes, deformation and inadequate capital. The processors complained of inadequate credit facility, inadequate processing facilities and poor sale and bad roads while consumers noted high cost of fish, fish fin problems, deterioration of fish and poor sanitary condition as major constraints. In conclusion, Fisheries enterprise is profitable for both the fishermen and processors. Therefore Government should provide loan scheme for the proper increase and boasting of fisher men and processors activities.

Keywords: profitability, constraints, enterprises, kano state, fishery.

I. Introduction

Fish is an important source of protein to the teeming population in Nigeria. Fish could be regarded as one of the major sources of animal protein in the country. According to Adekoya (2004), Fish represents about 55% of the protein sources intake of Nigerians. A large population of Nigeria is fish consumers with a demand estimated at about 1.4 million metric tons per annum. With a projected fish demand of 1.755 million metric tons in Nigeria (assuming a annual per capital fish consumption of 12.5kg and human population of 140.45 million, in the year 2000) and a total annual domestic production figure of less than 450,000metric tons, Nigeria has a fish supply deficit of about one million tons (Tobor, 1991). However, a demand supply gap of at least 0.7 million metric tons exists annually with imports making up the shortfall at a cost of about 2.0 million US dollars every five years (Miller and Atanda, 2004). Domestic fish production of about 500, 000 metric tons is supplied by artisanal fisher folks (estimated at about 85% despite over fishing in many water bodies across the country). Fish farmers (1%) and industrial capture fisheries (14%) (FDF, 2005) Fish is a popular, highly nutritious aquatic vertebra, which serves as a delicacy to most of the sub-Sahara Africa providing over 18% of total animals protein intake worldwide, with share as high as 40-60% in some West African states (FAO, 2002). Approximately 200 million Africans rely on fish as an important part of their diet. Ten million houses directly derive income from fish production, such as processing or trade. Yet the enormous potentials of fisheries to help feed and improve the nutritional status of the rapidly increasing population of Africa is greatly under-realized and precious aquatic resources are being degraded (World Fish Center, 2008).Fish is the cheapest animal's protein source in Nigeria, and smoked fish in particular has the potential to solve the pervasive protein shortage owing to its relative affordability compared with fresh fish. Boosting smoked fish consumption will entails retail price reduction, which is achievable only if the market for smoked fish operates efficiently (Taiwo, 2008).Fish as a food plays an important role in our diet. It provides vitamins such as A, B, C and D, contributes a considerable portion of the protein diet for many countries particularly developing ones. The human body utilizes protein from fish better than the protein from milk, beef, pork, chicken etc. Fish is also valued as a source of omega-3-fatty acids which is essential for the development of the brain and retina (Eyo, 2001).

II. Materials and Methods

a) Description of the Study Area

The study was carried out in Kano State; where freshwater fishes have a very old history due to availability of numerous freshwater bodies in the State. The state lies on latitude 10°33´N to 12°37´N and Longitude 7°40´E to 9°29´E. It is within Sudan Savannah zone. The total land area of the State is

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20,709 square kilometer. The mean daily maximum and minimum temperatures are 33.1°C and 15.85°C, respectively. Kano State is bordered to the north and northwest by Katsina State, to the east and northeast by Jigawa State, to the south by Bauchi State and to the southwest by Kaduna State. According to official Gazettes of the Federal Republic of Nigeria (2007), the State had a population of Nine million, Three hundred and Eighty Three thousand Six hundred and Eighty-two (9,383,682) inhabitants, with an annual growth rate of 3.3% who are mainly Hausa and Fulani by tribe (NPC, 2006). Agriculture is the major employment of labor in the State with many citizens involved in farming, fishing and marketing of aquatic resources such as fish, frogs either dried, smoked or other fish by-products. Major crops grown in the State include Millet, Sorghum, Cowpea, Corn, Wheat, Cotton, Gum Arabic, Groundnut and Rice, fish and fish products available in the State, while rearing of animals like cattle, horses, goat and sheep are as well prominent (Rim, 1992).The State has quite a large number of fish markets(up to sixteen). These include rural and urban markets where smoked and dry fishes are assembled. Most of the markets operate weekly or twice a week with the exception of city markets, which operate on daily basis. Next to farming are non-farm activities such as building, construction works, and so on. About twenty percent (20%) of the people engage in these activities to either supplement their income from farming, fishing or those from the privates or public sectors. Kano State has relatively abundant surface water resources in form of rivers, dams, lakes, reservoirs; up to sixteen freshwater resources owe to the Lake Chad Basin (L.C.B) which is the most productive in Africa, they comprise of Tiga Dam, Watari Dam, Kusalla Dam, Kanya Dam, Thomas Dam, Challawa Dam, Wasai Dam (Mbagwu, 1994). These rivers are sources of water for irrigation, domestic uses, fishing and transportation (Mbagwu, 1994). Kano State is currently made up of forty four (44) Local Government Areas (LGAs) and the State is agriculturally classified into three (3) zones by the Kano State Agricultural and Rural Development Authority, (KNARDA, 1995).

b) Sampling Techniques, Locations and Sizes

i. *Sampling Techniques*

The sampling frame for the data collection comprised of fishermen, processors, and consumers, in the three selected zones of Kano State in accordance with the existing Agricultural Development programme (ADPs) Zones in the State. Purposive sampling technique was used for sampling the respondents in the study area. The first stage involved purposive selection of one local government area from each zone based on relative abundance of hydrological features.

ii. *Sampling Locations*

On that basis of zoning and hydrological features three local government areas were selected as sampling locations (Table 1).

iii. *Sampling Sizes*

The second stage, involve simple random selection of respondents from the three selected landing sites. However, 30 each of fishermen, processors (Women) and 20 consumers were used. The distribution of these respondents within the purposively selected study sites was based on the proportion of the respondents in the site. A total of eighty (80) respondents were covered by the survey as shown on Table 1.

Table 1 : Study Location and Distribution of Respondents in each of the Selected Zone

ADPs	Location / Actors Fisher	Hydrological Features	Sample Size
I	Bebeji / Rano L.G. (Fisherman).	Tiga Dam	30
II	Kunchi L.G (Processors).	Ghari Dam	30
III	Gwale L.G. (Consumers).	Mai Allo Dam	20
	Total		80

c) Data Collection and Analytical Tools

i. *Methods of data collection*

Primary data were used for this study. The data were collected with the aid of structured questionnaire administered to the randomly selected respondents. The data on the socio-economic characteristics of the respondents, marketing costs returns, processing cost and data on fishing operations; as well as constraints militating against fish marketing in the study area, were collected using

Structured questionnaire was prepared; the items were tested for reliability and validity before been used for collections of the primary data. Three different types of questionnaire were used for each of the stakeholders: Fisherman, Processors and Consumers. Eighty (80) questionnaires were distributed to the targeted respondents. Data collection activities during these days include very early morning visits to landing sites to interview fishermen. Processors and Consumers were interviewed at different convenient time of the respondent.

ii. *Analytical tools*

The tools of analysis used for this study are:

- Descriptive Statistics and Simple Percentages,
- Profitability (Gross Margin), and
- Net Income (NI)

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iii. *Descriptive Statistical and Simple Percentages*

Frequencies tables and percentages were used to describe the socio-economic characteristics of the respondents. The characteristics include the Age, Marital Status, Education Attainment, and Occupation, Fishing experience and Sex among others.

iv. *Profitability Analysis of Stakeholders*

The budgetary technique was used to determine the gross margin income at each stage of the chain. This was used estimating as the gross margin is in accordance with Kaplinsky (2000):

$$\text{Gross Margin} = \frac{\text{Revenue- Cost of Goods Sold}}{\text{Revenue}}$$

III. Results and Discussion

a) Socio-economic characteristic of respondents

The result of the study indicated that majority of the fishermen have ages range between 41 – 48 years which have the highest percentage (46.25%) followed by 33 – 40years and 49 -56 years (16.25%), then followed by 25 -32 years (11.25%), then 57 -64 years (8.75%), and least percentage of 1.25% was registered on age range of between 65 -72 years. The implication of this finding is that middle aged people take part more in fishing activities than old aged and younger ones in the study area. This has to do with the fact that young adult or middle aged people are more energetic and may have better entrepreneurial drive in the society. It's so because at these aged range people are more energetic and healthier. This tally with the finding of Malgwi (2000) in his study of economics of fish production in Maiduguri metropolitan area, where he revealed that most of the fishermen are in their middle aged .This is also in line with findings of Bello (2000) and George *et al.(*2010) that age had a positive correlation with Agricultural Productivity. The result shown that 50.00% had household size of 1-6 members followed by 31.25% with household size of 7 – 12 members, then 12.5% have a household size of 13 – 18, thus majority of the respondents in the study area are having less household because the business is more of middle aged who have less family size than the old ones. "Middle aged people participate more fishery enterprise in Kano State. This result are similar to the findings of Fabusoro *et al.* (2007) who reported that average household size in Africa was about 9 person. Gender is an important socio-economic parameter, according to either male or female (Lahai *et al.,* 2000). The study revealed that both male and female were involved in all activities of fishing such as Fishing, processing, marketing and consumption with male having the majority (52.5%) , while female constitute (47.5%) of the respondents; although female participate in processing and marketing than other activities (Sule and Raji, 2006). Education is very important in every aspect of life and plays vital role in Aquaculture development; in enhancing easy assimilation, awareness and receptivity to innovation (Adams *et al*., 1987) so as to improve fish production. The result indicated the educational status of the respondents with majority having secondary education (31.25%) followed by Qur'anic education with (30.00%) This signifies that majority of the respondents had Qur'anic education due to the dominance of Islamic religion in the study area. With those having tertiary education having the least percentage of (7.5%). This findings is in line with that of Mele (2007), following his study of economic analysis of fresh fish marketing in Dadin kowa, Gombe, State where he found that majority of the respondents had formal education. Marital status described individual as married, single, divorced and widowed and this means single individuals may have more helping hands (Olubanjo *et.al.,* 1994). The result revealed the marital status of the respondents with 7.5% as married and divorced respectively, widowed 5.0% and majority are single with 80.00%. This implies that fishing activities is dominated by single respondents. This may be due to socio – cultural and religious factors in the study area. These agree with the findings of Mohammed, (2011) in evaluation of poultry eggs marketing in Kuje area council where 95% of the respondents were single. Fishing experience is the number of years that the fishermen spent in fishing business. The longer the experience in the business, the better the performances in fishing activities. The result indicated that most of the respondent (36.66%) had fishing experience of 16 – 20 years, 26.66 % of the respondents had fishing experience of 11 – 15 years and 23.33% of the respondents had fishing experience of 21 – 25 years, while 10.00% of the respondents had fishing experience of 6 – 10 years (least percentage). With this experience, it implies that the fishermen can manage their fishing activities and risk and make sound decision to enhance their performance.

Table 2 : Socio – Economic characteristics of Actors along Fisheries enterprises.

Variable	Category	Frequency	Percentage (%)
Age Range	25 – 35	9	11.25
	36 – 46	13	16.25
	47 – 57	37	46.25
	48 – 58	13	16.25
	59 -69	7	8.75
	70 - 80	1	1.25
	Total	80	100
Mean = 39.4	Min = 20	Max = 42	SD = ±5.67

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House hold size	1 - 6	40	50.00
	7 –12	25	31.25
	13 –18	10	12. 5
	19 – 24	3	3.75
	25 – 30	2	2.5
	Total	80	100
Mean = 7.3	Min = 2.1	Max = 23	SD = ±4.11

Source: Field Survey; 2014

Table 3 : Gender and Educational Status

Variables	Category	Frequency	Percentage (%)
Gender	Male	42	52.5
	Female	38	47.5
	Total	80	100
Educational Status	Primary	15	18.75
	Secondary	25	31.25
	Tertiary	6	7.5
	Qur'anic	24	30.00
	Adult	10	12.5
	Total	80	100

Sources: Field Survey, 2014.

Table 4 : Fishing Experiences of the Respondents

Experiences (Year)	Frequency		Percentage (%)
1 – 5	3		10.00
6 – 10	1		3.33
11 – 15	8		26.66
16 – 20	11		36.66
21 - 25	7		23.33
Total	30		100.00
Mean=14	Min=4.23	Max=26	SD=±4.62

Source: Field Survey, 2014.

Table 5 : Profitability of Fish Caught and Value / Week

Qty of fish caught/ (Week/kg)	Commission paid	Average Profit (N)	Frequency	Selling Price N 400/kg	Selling Price N250/kg	Cost Price	Labour
1-2	1.5	2	1200	750	100	150	200
3-4	3.5	6	8400	5250	100	150	2900
5-6	4.5	3	5400	3375	100	150	1775
7-8	7.5	8	24000	15,000	100	150	8750
9-10	9.5	7	26600	16,625	100	150	9725
11-12	11.5	4	18400	11,500	100	150	6650
Total		30	N84000	N52500	N600	N900	N30, 000

Source: Field Survey (2014)

%Profit = Profit/Selling Price X100
= 30,000/84,000 X100
= 35.71%

b) Production Constraints

The major constraints of the fishermen in the study area were found to be shrinking nature of the dams (63.33%) as they witness gross reduction in catches over the years since they noticed that the catches are also reducing, 13.33% identified high cost

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of fishing gears as their constraint, while 3.33% advanced loses due to deterioration as their problem; while 20.00% of the respondents identified lack of capital to the fishermen as the major constraint. The preferred solution of the aforementioned problems as suggested by the fishermen includes more water should be allocated to the dam so as to increase its level, 50.00%, 13.3% want availability of fishing gears at cheaper price as the solution to their problems. 3.33% demanded for provision of means of storage to avoid spoilage of catches. 33.33% wants provision of loan by Government or Commercial banks at lower interest rate as their solution to inadequate capital. Majority of the fish processors 66.66% identified inadequate credit facility as their major challenges in the business. Whereas 26.66% of them identified inefficient processing facilities, the remaining 6.66% identified poor sale as their constraints. Accordingly, several solutions were proffered by the processors and 60.00% of them want provision of credit at lower interest and road to be repaired and secured throughout the state and beyond, 20.00% want improved modern processing facilities made available to them as solution to the problem and finally, the remaining, 20.00% want the development of the marketing system in the study area as well as uniform price system. Consumers are the end users of fishery enterprise and also the main target of all the stakeholders have their own thinking of the problems of fish as it affects their own role in the enterprise. For instant 65.00% of them sees high cost of fish as the major problem leading to reduction in their purchasing power, 10.00% mentioned fish – pin problems as it leads to injury or even loss of life and therefore, they have to take their valuable time to remove the pin before or after cooking it, 15.00% complained that the deteriorating nature of fish is their major constraints in fish consumption and also 10.00% highlighted poor sanitary condition of the fish market and marketing as their major constraints. Accordingly, in order to address the several problems by the consumers, enough credit facilities should be provided to boost the production at least by 50.00%. 10.00% suggested that number of exporting fin fish to the various water body should be minimized 30.00% want improved modern processing facilities made available to them as the solution, finally the remaining 10.00% have good hygienic condition as the proper solution to their constraints.

Table 6 : Fishermen Constraints in Kano State

Fishing Constraint	Frequency	Percentage (%)
Restrictions by the dam	10	33.33
Aquatic vegetation menace	4	13.33
Reduction in catches (sizes and numbers)	8	26.67
High cost of fishing gears	4	13.33
Losses due to deterioration	1	3.33
Inadequate capital	3	10.00
Total	30	100.00

Source: Field Survey (2014)

Table 7 : Constraints of the Fish Processors in Kano State

Processors constraints	Frequency	Percentage (%)
Inadequate credit facility	16	53.33
Inadequate processing facilities	8	26.66
Poor sale	2	6.66
Poor road linkages	4	13.33
Total	30	100.00

Source: Field Survey (2014)

Table 8 : Constraints of the Fish Processors in Kano State

Processors constraints	Frequency	Percentage (%)
Inadequate credit facility	16	53.33
Inadequate processing facilities	8	26.66
Poor sale	2	6.66
Poor road linkages	4	13.33
Total	30	100.00

IV. Summary, Conclusion and Recommendations

The study examined the socio-economic and profitability of fishery enterprises in Kano state, Nigeria. Multistage sampling technique as employed to select a total of 80 stakeholders along the fishery enterprise, 30 fishermen, 30 processors and 20 consumers. The sampling was based on purposive and simple random selection technique. The collected data were subjected

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to both descriptive statistics mainly. The study further attempted to describe the socio – economic characteristics of actors (Fishermen, processors and final consumers) along the fisheries enterprises, estimated the profitability by the actors along the fisheries enterprises, determined the consumer preference to fish in the study area and finally identified the major constraints, as well as possible solution for all actors in the fishery enterprise. Based on the results presented, it can be concluded that fishermen, processors in the study area were operated on small scale, because both have low level of formal education and limited financial resources to use modern techniques of catching fish and processing along the fishery enterprise. Fishermen in the study area were found to be productive because they gave a mean gross margin return of #74350 at the period of raining season. All the stakeholders were found to be relatively efficient to the business operation. Dwindling of the dams, lack of effective processing and storage facilities, inadequate credit facilities, high cost of transportation, bad road network were identified as the major problem prevailing among the actors in the fishery enterprise in Kano state. The study recommends that fishermen and processors level of capital should be increased through increasing their access to loan and credit facilities. Fishermen and processors should be encouraged to form co-operative organization at all level. Credit facilities/institution should be made available to the fishermen and processors through their co-operative organization. Provision of good road network and other infrastructural facilities that link rural marketers with urban markets. Government should make a policy that will ensure access to major fishing gears at the subsidized rate to the fishermen in the study area. This will encourage the participation of more fishermen in the fishing business.

References Références Referencias

1. Adekoya, B.B. and Millers, J.I.R. (2004). "Fish cage culture potential in Nigeria". An Overview National Agriculture Magazine Published by Fandatom. Consultants Limited, Abuja.
2. Bello MO (2000). "Categorization of Potential Adopters for Organic-Based Fertilizer Among Vegetable Farmers in Ojo LGA State. B. Agric. Project University of Lagos Agriculture, Abeokuta.
3. Eyo, A.A. (2001). Fish Processing Technology in the policies, published by National Institute for Fresh water Fisheries Research (NIFFR) New Bussa, Niger State, Nigeria. Pp. 104- 279.
4. Fabusoro E, Lawal-Adebowale OA, Akinloye AK (2007). A study of rural livestock farmers' patronage of veterinary services for healthcare of small farm animals in Ogun State. Nig. J. Anim. Prod., 34(1&2): 132-138.
5. FAO (2002). State of world fisheries and Aquaculture report. February 2003. FAO Fisheries Report. No. 702. Rome, FAO.
6. Federal Department of Fisheries (2005). Materials Resources Management and Environment Department Integrated Costal Management and Agriculture Forestry Fisheries Guideline Rome.
7. Kano State Agriculture and Rural Development Authority (KNARD). A Headquarter Kano (1995). Bulletin, Kano Nigeria. Pp. 1 – 19.
8. Miller, J. and Atanda, T. (2004). "Opportunities in Aquaculture and Fisheries". Fisheries farming big industry in the future. National Agriculture Focus. Vol. 1 No.4. Pp10. An Agricultural News Magazine Published by Foundation. Constant Limited, Abuja, October Edited.
9. Malgwi (2000); Economic Analysis of Fish Production in Dadin kowa Gombe State, unpublished MSC thesis Department of Agricultural Economics and extension, Federal University of Technology Yola Adamawa State.
10. Mele C. (2007) Economic Analysis of Fresh Fish Marketing in Dadinkowa, Gombe State. Unpublished MSC thesis University of Maiduguri, Maiduguri Nigeria.
11. National Population Commission (2006). Population Census of the Federal Republic of Nigeria Report at the National Level Census Report. Pp. 30 – 35.
12. Rim, O. (1992). Nigeria National Livestock Resources Survey. (Vol. IV) Report by Resources Inventory and Management Limited (RIM) to FDL and PCS. Abuja, Nigeria. Retrieve from http://www.fao.org/wairdoss/ilri/*5548e/*5548e09.html#top of page. October 2012.
13. Sogbesan, O.A. (2014). Non-conventional Animal Protein Feed Stuffs for the Culture of Catfish. University of Ibadan Press 104.
14. Sule O.D and Raji,A. (2006) Socio economic survey of woman in Artisanal fisheries in lake chad area a case study of kukawa.NIFFR.1998 annual report. NIFFR. Pp 195 – 203.
15. Taiwo, E. (2008). Market Integration and price Exogeneity in Dry Fish Marketing in Nigeria. Pp 23-27.
16. Tobor. J, L. (1991). A fishery Research Activities in Nigerian Institute for Oceanography Research for sufficiency in fish production in Paper presented the fourth the Annual seminar of the committee of Directors of Research Institutes (CODRI), NIOMR, Lagos Dec. 10.1991.

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Measuring Sustainability of Best Practices in Logistics Chains

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Abstract- Previously firms mainly based on financial performance to assess their progress. Thenceforth, maturity of logistic chain must be evaluated from a more comprehensive performance including, economic, environmental and social dimensions.

As we know, each logistic chain is characterized by several best practices, so the purpose of this paper is to determine the sustainable performance of each one from these best practices.

Aware that logistic chain performance should balance economic profitability with respect for natural environment and social performance, with objective to satisfy all stakeholders, the authors propose a mathematical approach to assess the performance. This mathematical approach was tested in a logistics chain of automobile industry.

Keywords: *logistic chain, best practice, sustainable development, sustainable criteria, composite sustainable development index.*

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Measuring Sustainability of Best Practices in Logistics Chains

A. Haddach [α], M. Ammari [σ] & Laïla Ben Allal [ρ]

Abstract- Previously firms mainly based on financial performance to assess their progress. Thenceforth, maturity of logistic chain must be evaluated from a more comprehensive performance including, economic, environmental and social dimensions.

As we know, each logistic chain is characterized by several best practices, so the purpose of this paper is to determine the sustainable performance of each one from these best practices.

Aware that logistic chain performance should balance economic profitability with respect for natural environment and social performance, with objective to satisfy all stakeholders, the authors propose a mathematical approach to assess the performance. This mathematical approach was tested in a logistics chain of automobile industry.

The results indicate that the proposed module can be used as a tool to evaluate sustainability of each logistic chain whatever the field of activity.

Till now, there are a very few number of tools that take account the three sustainable dimensions (economic, environmental and social) in the same time to measure sustainability of best practices in logistics chains. This study proposes a mathematical module to approach this subject.

Keywords: logistic chain, best practice, sustainable development, sustainable criteria, composite sustainable development index.

I. Introduction

The main objective in logistics chains management was to improve industrial competitiveness by minimizing costs, providing level of service required by customer, effectively allocating activities on actors of production, distribution and transport. Currently, logistics chains must integrate two new dimensions in their performance: their impact on society and on environment. logistics chains must develop methods and approaches to consider and measure their impacts on economic, environmental and social levels and analyze interactions between these impacts. Traditional mechanisms for performance measurement, such as costs, do not give logistics chains a clear view on consequences of their management practices. Approaches available today are mainly focused on environmental sphere, when the reality of impacts of logistic chain management practices is more complex, integrating the three dimensions of sustainable development (economic, environmental and social). It's true that public institutions encourage firms to make development sustainable a strategi issue. In logistic chain, sustainable development is a transversal concept that affects all stakeholders who have different and sometimes conflicting goals. Performance is complex to master given different processes to consider, various stakeholders to integrate and various dimensions in which stakes are declined. To take into account all logistics chains impacts, it is essential to develop a comprehensive performance evaluation method of logistics chains. This method must be consistent with specificities of each stakeholder. The difficulty in logistic chain is to measure interactions between the three dimensions of sustainable performance. To address this problem of measuring the sustainable performance of best practices in logistics chains, it is pertinent to ask the following questions: why consider sustainability in logistics chains? What are the motivations of logistics chains to develop a sustainable approach? What are the specificities of sustainable issues in logistics chains?

II. Logistic Chain

a) Definition

There are in literatures many definitions of logistic chain. Of these, we adopt the following ones: logistic chain refers to a network consisting of various units business (suppliers, subcontractors, manufacturers, distributors, retailers, etc.) to provide a product or service for end customer, from the supplier's supplier involving three types of flows: physical, informational and financial (American Production Inventory Control Society, 2010). Physical flows relate to all materials that pass through the logistic chain from upstream to downstream (raw materials, intermediate products and finished products). Other materials can flow from downstream to upstream, such as containers, packaging, pallets, product returns or end-of-life products in the case of reverse logistics. Information flows concern exchange of information and data between actors of chain (stocks and outstanding level, customer demand, etc.) which are made in both sense. Finally, financial flows are the cash flows associated with the physical flow [1].

b) logistic chain management

Like logistic chain, the concept of logistic chain management has led to several definitions:

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"Supply chain management is an integrated management approach, which is to lead a whole, the flow of material and information from suppliers to end users, as well as the return flow through planning tools and decision support." [2].

"Supply chain management is a set of approaches used to effectively integrate suppliers, producers, distributors, so that merchandise is produced and distributed in the right quantity, at the right place and at the right time in order to minimize costs and ensure the service level required by customer." [3].

c) Decision-making levels

logistic chain management is a widely studied topic in scientific literature, we will approach it from a sustainable point of view, which today is more innovative.

We can classify decisions about logistic chain management in three categories [4]:

Strategic decision concerns decisions taken by senior management and are the guidances on long term, from six months to several years.

Tactical decision is concerned with decisions taken by the firms executives over the medium term that is to say from a few weeks to few months.

Operational decision has a more limited scope in space and in time. These are decisions taken by team leaders during day or week.

III. Sustainable Development

a) Concept of Sustainable development

The concept of sustainable development has its origins from the 18th century with concerns about the consumption of the Earth's resources, expressed for example in the work of Malthus on the relationship between the growth dynamics of the population and production. Most recent origins of sustainable development dates back to the work of the Club of Rome which is known worldwide in 1972 by the famous Meadows report "The Limits to Growth".

The term "sustainable development" does not appear until early 1980s as part of development of the World Conservation Strategy.

b) Sustainability criteria

The concept of sustainable development encompasses three dimensions - economic, environmental and social - united by a set of trade-offs.

Economic criteria: because of the unequal distribution of the wealth produced between countries and between social strata within a country, the economic challenge is to restore the economy's place in society.

Environmental criteria: they mainly concern: global warming and its consequences, biodiversity erosion, depletion of natural resources and pollution.

Social criteria: they include among others, the increase in global inequality, poverty and access to basic needs.

IV. Sustainable Development in Firms and in Logistics Chains

a) Criteria of sustainable performance

Traditionally, criteria taken into account to assess supply chains and firms performance are related to financial aspects, flexibility, responsiveness, quality and reliability [5].However, taking into account environmental and social concerns in the context of CSR (Corporate Social Responsibility) change performance assessment. This must indeed be extended to consider all three dimensions of sustainable development, in line with the principles of triple bottom. There is still no consensus on what should be performances environmental and social. They depend in fact on several variables as industrial sector, country of location of activities, etc. It is therefore difficult to characterize sustainable performance. Nevertheless, there are several international standards (SCOR repository, GRI (Global Reporting Initiative) , ISO 26000 , etc.) and works in literature that provide economic, environmental and social criteria more or less common and generic that can be adapted.

b) Methods for evaluating sustainable performance

The most numerous approaches are qualitative, they include literature reviews, conceptual models and case studies. Quantitative approaches are the mathematical models.

i. *Literature reviews*

Despite international efforts to measure sustainable development, few indexes have a comprehensive approach taking into account the three dimensions of sustainability and in most cases, the emphasis is on one of the three aspects [6]. Interaction between logistic chain and sustainability is intended to optimize total cost, including the impacts of resource depletion and exponential waste production and pollutants, rather than the current cost of a product [7]. Value creation in context of sustainable development comes from the importance of collaboration between players in logistic chain [8].

ii. *Conceptual models*

Most conceptual models found in the literature focus on methodologies and frameworks to adopt, to select and develop indicators to measure the sustainable performance. after analyzing the most recognized standards for sustainable development, including GRI and ISO 14301 (ISO 2004), a selection of indicators to measure sustainable performance of production was offered [9]. Then a detailed guide in eight steps of implementation of these indicators was proposed [10]. There is a method for assessing the degree of sustainability of a business operation [11].

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The goal of this method is to select a number of indicators that meet four criteria: they must be consistent with the company's business, reflect objectivity, they must be balanced and all indicators selected should represent the concept of sustainable development. More recently the integration of information, other than financial, appeared in the performance measure as a necessity.

iii. *Case studies*

Following an analyzes based on 89 of automotive industries within China, the main motivations for firms to engage in CSR strategy are the regulatory pressures, those of the market and also internal factors of firm [12]. In addition, results of these analyze put forward a slight correlation between implementation of CSR practices and environmental and economic performance but a lack of connection with the financial performances. Many studies based on Chinese [13] and United States [14] firms gave a similar conclusions.

iv. *Mathematical models*

To assess the sustainable performance, many authors present models of aggregation of indicators. In this domain, exist a model to assess the sustainable performance through a comprehensive composite index (I_S), which includes three sub-indices corresponding respectively to economic, environmental and social performances [15]. Also there is a method for the development of a composite index of sustainable performance in steel field [16], based on three lasting performance and AHP (Analytic Hierarchy Process) method. Despite international research efforts on assessing the sustainable performance, only a very small number of approaches take into account the three dimensions of social responsibility in firms and (Singh et al., 2009). Indeed, there is not, nowadays, an available model permet to integrate overall assessment in terms of logistics chains management. Social dimension is poorly represented in existing indices.

V. Proposal of a Module to Evaluate Sustainable Development of Best Practices in Logistics Chains

a) Sustainable criteria

To measure sustainable performance of practices in logistic chain, and thus facilitate decision-making, we propose an analytical evaluation model.We propose to characterize each dimension of sustainable development by a number of criteria (Table 1).

We based our selection of criteria on the three recommended requirements by [17]:

1) *Completeness:* we must not it has too few criteria; otherwise, it means that some assessment elements were not taken into account.
2) *Non-redundant:* it should not be that there are criteria that are duplicated, thus more than necessary.
3) *Consistency:* global preferences (all criteria) are consistent with local preferences (for a single criteria).

Table 1 : Characterization model of sustainable performance

Dimension	Criteria
Economic	Financial Performance (FP) Quality (QL) Reliability (RL) Reactivity (RC) Flexibility (FL)
Environmental	Environmental management (EM) Pollution (PL) Use of Resources (UR) Natural environment (NE) Dangerous substances (DS)
Social	Labor rights (LR) Work conditions (WC) Health and security (HS) consumers (CN) Community involvement (CI)

b) Best practices of logistic chain management

The literature provides many definitions of best practices of logistic chain, among them, we adopt the following one:

"... A process, a technique, innovative use of technology, equipment or resource that has generated a significant improvement in cost, quality, performance, safety, environment or other measurable factor impacting the organization" [18].

All proposed definitions emphasizes different aspects of concept of best practice. From these definitions, we hold that a best practice is formalised, effective and reusable.

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c) *Maturity scale of practices*

We can characterize maturity of a practice by two properties: stability and scope:

Stability of practice refers to regularity of implementation thereof by the firm, it can be occasional or systematic.

Scope of practice means the circumference over which it extends. It can only apply to a few products / services or all of the products / services.

Because a practice occasionally installed on some products will not generate the same impacts that a practice consistently implemented on all products of logistic chain, we propose four degrees of practices maturity in logistic chain , which are as follows (Fig. 1):

Degree 0: practice is little or no implemented. Therefore, its implementation will not impact significantly the criteria.

Degree 1: occasionally, this practice is in place for certain products / services of the logistic chain.

Degree 2: practice is implementing systematically for selected product / service or occasionally for all products / services.

Degree 3: practice is implementing consistently for all of its products / services.

d) *Impacts assessment scale*

Simultaneously assess the economic, environmental and social impacts, be very complicated because of scales that are very different,that is way we propose to evaluate the impact of each management practice

(P_K) following a scale of three qualitative values:

$\{+1\}$ If impact of practice (P_K) is seen as positive on a given criteria.

$\{-1\}$ If impact of practice (P_K) is seen as negative on a given criteria.

$\{0\}$ If impact of practice (P_K) is seen as neutral on a given criteria.

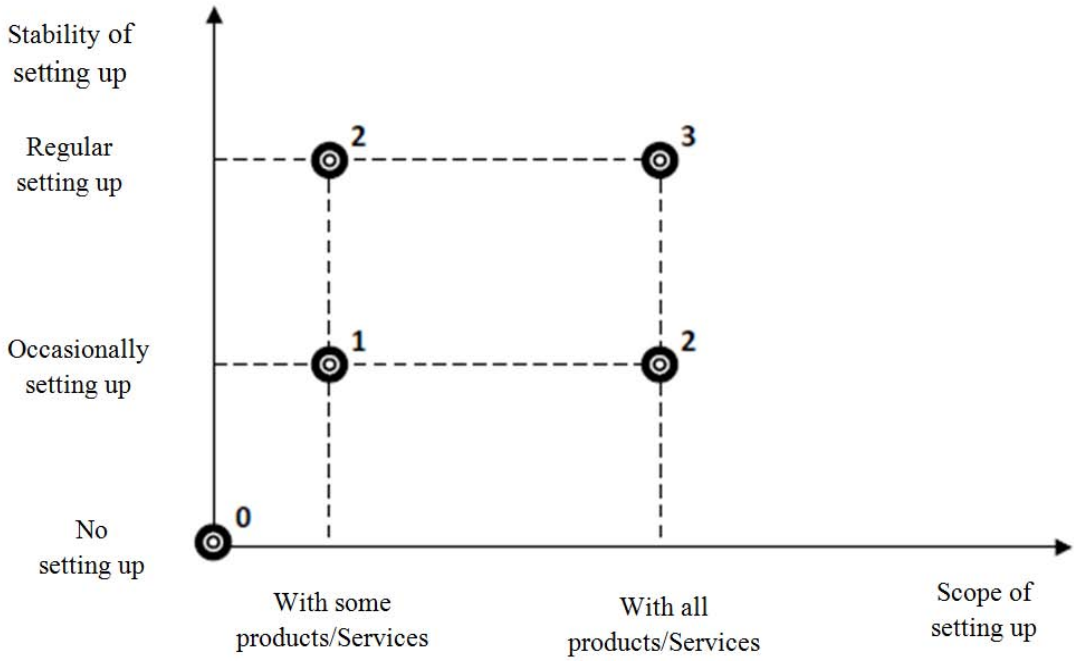


Fig. 1 : Maturity of practices implementation [22]

e) *Assessment model for sustainable performance*

When aggregating we face a difficulty which affects the inequality of importance of sustainable criteria (corporate strategy, industry type, ...) which suggests to weight criteria to express their relative importance . To do this we use the principle of weighting of AHP method. AHP method is simple to use and allows to take into account both quantitative and qualitative criteria. Furthermore, the lack of objectivity in assessing relative importance of criteria is reduced [19]. We adopt this method to calculate a composite sustainability performance index (I_S) own to achievement of a given activity in logistic chain.

The method of calculating the composite sustainability performance index is prepared in three steps (Fig. 2), and is divided into several parts (Fig. 3).

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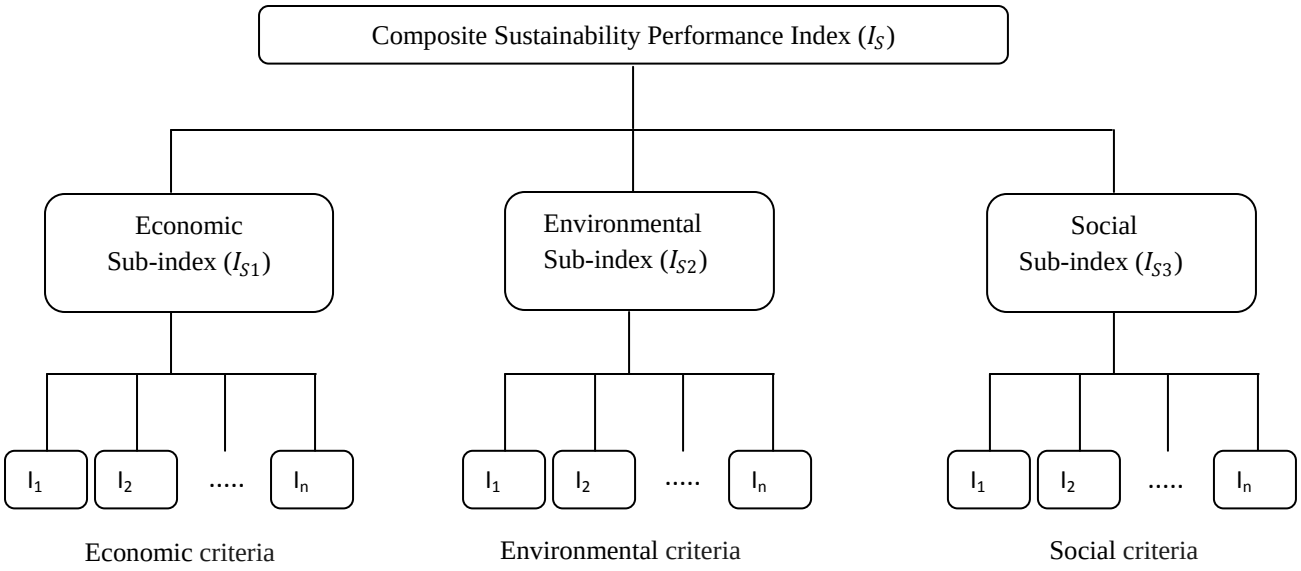


Fig. 2 : Generic hierarchy scheme for calculation of composite sustainable development index (I_S)

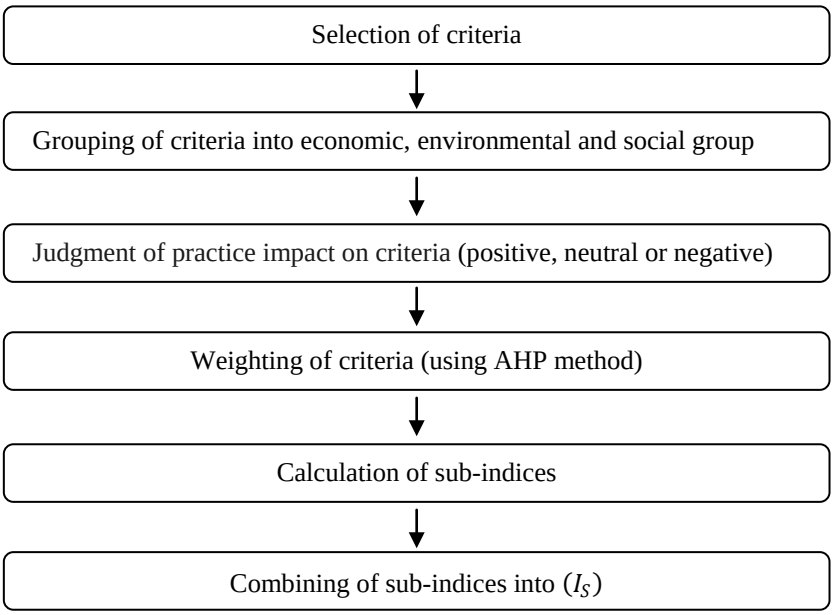


Fig. 3 : Calculation procedure of (I_S)

Step 1

We define $I(P_K, Eco_i)$ impact measurement of practice (P_K) on the i[th] economic criteria as follows:

$$I(P_K, Eco_i) \in \{-1\,;0\,;+1\}\ \forall k$$

$$where\ i: sustainable\ criteria\ \ and\ 1 \leq i \ll 5$$

We do the same thing for environmental and social criteria:

$$I(P_K, Env_i) \in \{-1\,;0\,;+1\}\ \forall k$$

$$where\ i: sustainable\ criteria\ \ and\ 1 \leq i \ll 5$$

$$I(P_K, Soc_i) \in \{-1\,;0\,;+1\}\ \forall k$$

$$where\ i: sustainable\ criteria\ \ and\ 1 \leq i \ll 5$$

To take into account the importance of implementation of a given practice in the logistic chain, we propose to evaluate the weighted impact of each practice on the three sustainable dimensions:

$$W_{id} = Weighted\ impact\ (P_K, Env_i)$$

$$= I(P_K, Eco_i) \times w(P_K)$$

$$where\ w(P_K) \in \{0, \dots, 3\}\,; -3 \leq W_{id} \leq +3$$

$$W_{id} = Weighted\ impact\ (P_K, Env_i)$$

$$= I(P_K, Env_i) \times w(P_K)$$

$$where\ w(P_K) \in \{0, \dots, 3\}\,; -3 \leq W_{id} \leq +3$$

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$$W_{id} = Weighted\ impact I\ (P_K, Soc_i)$$
$$= I(P_K, Soc_i) \times w(P_K)$$
$$where\ w(P_K) \in \{0, \dots, 3\}; -3 \leq W_{id} \leq +3$$

Step 2

For each sustainable dimension d (d ∈{Eco, Env, Soc}), we build a matrix A = (n x n); n= 5 where criteria of each dimension are compared 2 by 2 by the decision maker.

The comparisons are made by posing the question which of two criteria i and j is more important with respect to the sustainable development. The intensity of preference is expressed on a factor scale from 1 to 9 (Table 2). The value of 1 indicates equality between the two criteria while a preference of 9 indicates that one criteria is nine times more important than the one which it is being compared. This scale was chosen, because in this way comparisons are being made within a limited range where perception is sensitive enough to make a distinction. In the matrix A,if criteria i is "p-times" the importance of criteria j, then, necessarily, criteria j is "1/p-times" the importance of criteria i. where the diagonal $a_{ii} = 1$ and reciprocal property $a_{ji} = \left(\frac{1}{a_{ij}}\right)$ $where\ i, j = 1, \dots, n$

Weight of criteria i of sustinable dimension d (w_{id}) is given by the formula:

$$w_{id} = \frac{\sum_{j=1}^{n} \frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}}}{n}$$

Table 2 : Comparison scale of AHP method [23]

Preference factor, p	Importance definition
1	Equal importance
3	Moderate importance of one over another
5	Strong or essential importance of one over another
7	Very strong or demonstrated importance of one over another
9	Extreme importance of one over another
2,4,6,8	Intermediate values
Reciprocal, 1/p	Reciprocal for inverse comparison

One disadvantage of AHP method outlined in literature [20] is the problem of intransitivity preferences. Indeed, pairwise comparison may lead to the non-transitivity that can not be removed as part of AHP method.

However, perfect consistency rarely occurs in practice. In AHP method the pairwise comparisons in a judgment matrix are considered to be adequately consistent if the corresponding consistency ratio (CR) is less than 10% [21] . CR coefficient is calculated as follows: first a consistency index (CI) needs to be estimated. This is done by adding the columns in the judgment matrix and multiply the resulting vector by the vector of priorities (i.e., the approximated eigenvector) obtained earlier. This yields an approximation of the maximum eigenvalue, denoted by λ_{max} . Then, CI value is calculated by using the formula:

$$CI = (\lambda_{max} - n)/(n-1)$$

Next, CR is obtained by dividing CI by random consistency index (RI) as given in table 3.

Table 3 : RI values for different values of n

n	1	2	3	4	5	6	7	8	9
RI	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45

Otherwise matrix A should be evaluated:

$$CR = CI/RI$$

Thus we calculate sub-indices of each sustainable dimension as follows:

$$I_{S1} = \sum_{i=1}^{n} W_{i1} \times w_{i1} \qquad -3 \ll I_{S1} \ll +3$$
$$I_{S2} = \sum_{i=1}^{n} W_{i2} \times w_{i2} \qquad -3 \ll I_{S2} \ll +3$$
$$I_{S3} = \sum_{i=1}^{n} W_{i3} \times w_{i3} \qquad -3 \ll I_{S3} \ll +3$$

Interpretation

$I_{S1} \in [-3, 0[$: selected practice has a negative economic impact on logistic chain.

$I_{S1} = 0$: selected practice does not has any economic impact on logistic chain.

$I_{S1} \in]0, +1.500[$: selected practice has a positive economic impact on logistic chain but insufficient.

$I_{S1} \in [1.500, +3]$: selected practice has a positive and sufficient economic impact on logistic chain .

$I_{S2} \in [-3, 0[$: selected practice has a negative environmental impact on logistic chain.

$I_{S2} = 0$: selected practice does not has any environmental impact on logistic chain.

$I_{S2} \in]0, +1.500[$: selected practice has a positive environmental impact on logistic chain but insufficient.

$I_{S2} \in [1.500, +3]$: selected practice has a positive and sufficient environmental impact on logistic chain.

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$I_{S3} \in [-3, 0[$: selected practice has a negative social impact on logistic chain.

$I_{S3} = 0$: selected practice does not has any social impact on logistic chain.

$I_{S3} \in]0, +1.500[$: selected practice has a positive social impact on logistic chain but insufficient.

$I_{S3} \in [1.500, +3]$: selected practice has a positive and sufficient social impact on logistic chain.

Step 3

Equal weights (1/3) have been attributed to each sub-index to derive (I_S). Certainly, other methods of weighting the sub-indices of (I_S) could be applied, for example by using public opinion polls or involving expert judgment. However, which makes equal weighting a sensible option.

Finally, we find composite sustainable development index (I_S), based on the following equation:

$$I_S = \frac{(I_{S1} + I_{S2} + I_{S3})}{3} \; where - 3 \leq I_S \leq +3$$

$I_S \in [-3, 0[$: means that the selected practice has a negative global impact on logistic chain.

$I_S = 0$: selected practice does not has any global impact on logistic chain.

$I_S \in [1.500, +3]$: selected practice has a positive global impact on logistic chain but insufficient.

$I_S \in [1.500, +3]$: selected practice has a positive and sufficient global impact on logistic chain.

(We can use AHP method to weight the three dimensions).

IV. Application

Effectiveness of the proposed model has been tested with an application. We choose to study the impact of "Lean Manufacturing" on a automotive logistic chain within Morocco. To achieve this goal, we have determined the impact of this practice on each one from our sustainable criteria, considering that this practice is setting up in chosen logistic chain with a maturity which equals 2 (Table 4, Appendix A).

Table 4 : Practice weighting

Dimension	Criteria	Practice impact	Maturity of practice	Weighted practice
Economic dimension	Financial Performance (FP)	+1	+2	+2
	Quality (QL)	+1	+2	+2
	Reliability (RL)	+1	+2	+2
	Reactivity (RC)	+1	+2	+2
	Flexibility (FL)	+1	+2	+2
Environmental dimension	Environmental management (EM)	+1	+2	+2
	Pollution (PL)	+1	+2	+2
	Use of Resources (UR)	+1	+2	+2
	Natural environment (NE)	0	+2	0
	Dangerous substances (DS)	0	+2	0
Social dimension	Labor rights (LR)	+1	+2	+2
	Work conditions (WC)	-1	+2	-2
	Health and security (HS)	+1	+2	+2
	consumers (CN)	+1	+2	+2
	Community involvement (CI)	+1	+2	+2

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Tables 5 : Calculating weights of sustainable criteria using AHP method

Economic dimension

	PF	QL	RL	RC	FL
PF	1	2	4	4	4
QL	1/2	1	2	2	2
RL	1/4	1/2	1	1	1
RC	1/4	1/2	1	1	3
FL	1/4	1/2	1	1/3	1
Sum	2.250	4.500	9	8.333	11

$\frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}}$

	PF	QL	RL	RC	FL
PF	0.444	0.444	0.444	0.480	0.364
QL	0.222	0.222	0.222	0.240	0.182
RL	0.111	0.111	0.111	0.120	0.091
RC	0.111	0.111	0.111	0.120	0.273
FL	0.111	0.111	0.111	0.040	0.091

w(PF)	0.435
w(QL)	0.218
w(RL)	0.109
w(RC)	0.145
w(FL)	0.093

λ_{max}==5.155; CI=0.039; RI=5; **CR=0.008**

Environmental dimension

	EM	PL	UR	NE	DS
EM	1	1/3	1	2	2
PL	3	1	2	3	1
UR	1	1/2	1	4	1
NE	1/2	1/3	1/4	1	1
DS	1/2	1	1	1	1
Sum	6	3.166	5.250	11	6

$\frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}}$

	EM	PL	UR	NE	DS
EM	0.167	0.105	0.190	0.182	0.333
PL	0.500	0.316	0.381	0.273	0.167
UR	0.167	0.158	0.190	0.364	0.167
NE	0.083	0.105	0.048	0.091	0.167
DS	0.083	0.316	0.190	0.091	0.167

w(EM)	0.195
w(PL)	0.327
w(UR)	0.209
w(NE)	0.099
w(DS)	0.169

λ_{max}==5.194; CI=0.049; RI=1.12; **CR=0.044**

Social dimension

	LR	WC	HS	CN	CI
LR	1	2	1	1	1
WC	0.500	1	0.250	1	1
HS	1	4	1	1	3
CN	1	1	1	1	3
CI	1	1	0.333	0.333	1
Sum	4.5	9	3.583	4.333	9

$\frac{a_{ij}}{\sum_{k=1}^{n} a_{kj}}$

	LR	WC	HS	CN	CI
LR	0.222	0.222	0.279	0.231	0.111
WC	0.111	0.111	0.070	0.231	0.111
HS	0.222	0.444	0.279	0.231	0.333
CN	0.222	0.111	0.279	0.231	0.333
CI	0.222	0.111	0.093	0.077	0.111

w(LR)	0.213
w(WC)	0.127
w(HS)	0.302
w(CN)	0.235
w(CI)	0.123

λ_{max}=5.292; CI=0.073; RI=5; **CR=0.065**

Appendix A : Justification of impacts of "Lean Manufacturing" on each sustainable criteria

Criteria	Practice impact	Justification
Financial Performance (FP)	+1	"Enables organizations to determine how current process steps and cycle efficiencies affect overall supply chain reliability. Details can be displayed through value stream mapping" [24].
Quality (QL)	+1	"Process cycle- value added process steps" [24].
Reliability (RL)	+1	"Lean creates and processes" [24]
Reactivity (RC)	+1	3 respondents
Flexibility (FL)	+1	4 respondents
Environmental management (EM)	+1	"Some regulatory issues can be encountered when applying lean to environmentally sensitive processes" (EPA (Environmental Protection Agency), 2003).
Pollution (PL)	+1	"Lean is highly conducive to waste minimization and pollution prevention" (EPA, 2003).
Use of Resources (UR)	+1	3 respondents
Natural environment (NE)	0	"Lean is highly conducive to waste minimization and pollution prevention" (EPA, 2003).
Dangerous substances (DS)	0	4 respondents
Labor rights (LR)	+1	"Positive impacts of LP (Lean Production) on working conditions have also been emphasized. Berggren (1992), identified a set of these impacts, such as: its egalitarian character" [25].
Work conditions (WC)	-1	"Typical principles of LP increase stress in workers and reduce their autonomy" [24].
Health and security (HS)	+1	"Positive impacts of LP on working conditions have also been emphasized. Berggren (1992), identified a set of these impacts, such as: job security" [25].
consumers (CN)	+1	3 respondents
Community involvement (CI)	+1	"Positive impacts of LP on working conditions have also been emphasized. Berggren (1992) identified a set of these impacts, such as: management giving value to workers' proposals for improvement [25].

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Computing of sub-indices of each dimension and composite sustainable development index:

$$I_{S1} = (2 \times 0.435) + (2 \times 0.218) + (2 \times 0.109) + (2 \times 0.145) + (2 \times 0.093) = 2$$

$$I_{S2} = (2 \times 0.195) + (2 \times 0.327) + (2 \times 0.209) + (0 \times 0.099) + (0 \times 0.169) = 1.464$$

$$I_{S3} = (2 \times 0.213) + (2 \times 0.127) + (2 \times 0.302) + (2 \times 0.235) + (2 \times 0.123) = 1.148$$

$$I_S = (2 + 1.464 + 1.148)/3 = 1.537$$

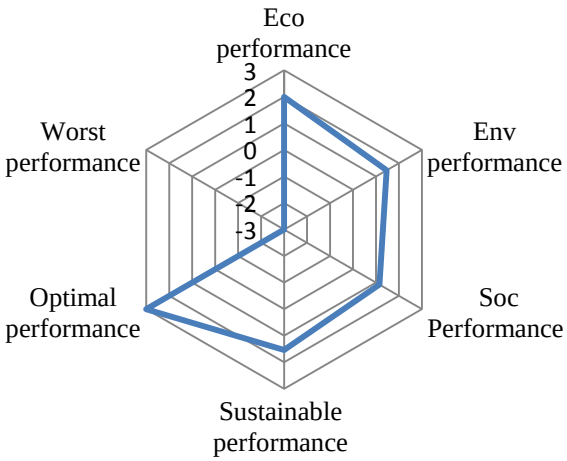


Fig. 4 : Graphical representation of results

a) Interpretation of results

We consider a practice very diffused almost in all logistics chains. Criteria of each sustainable dimension were compared in pairs (Table 6) and a weight was calculated for each one of them. Consistency of judgments matrices was also verified. Values obtained for sub-indices show the performance achieved for each sustainable dimension through this practice. Five economic, five environmental and five social indicators were aggregated into sustainability sub-indices for a logistic chain and finally combined into a composite sustainable development index (I_S).

Impact of selected practice "Lean Manufacturing" is determined following a study of academic results (Appendix A). In considered example, value of economic sub-index is the high and exceeds the average (1.500) indicating that the activity is efficient from an economic point of view and the same for the environmental sub-index.Value of social sub-index is the lower and does not exceed the average (1.500), indicating that the activity is not efficient from a social point of view. Value of aggregate index of performance of this practice is higher than average which indicates that performance level is sufficient.

b) Discussion of findings

The purpose of (I_S) is to give both a simplified and quantified expression for a more complex composition of several criteria. It can be used to inform decision-makers of development trends in logistic chain. However, it may also be included in a more targeted context, such as reflecting the status of firm regarding sustainability, providing information to critical decision processes, or possibly forming the basis for a logistic chain to head in a certain direction. This evaluation module helps to highlight opportunities for improvement and where best practices might be found. It provides early warning information and tracks sustainability of logistic chain. Decision-makers could easily interpret (I_S) and its corresponding sub-indices than trying to find a trend in many separate criteria of sustainable development. If included in the annual sustainability report, we could use this modul to present the progress of logistic chain in terms of sustainability to various parties interested in logistic chain sustainability. Also, this evaluation module if would be applied to different logistics chains, it would be possible to compare and rank them in terms of sustainability.

Based on our evaluation module of sustainable performance we can decide if we apply or not a given best practice in logistic chain following its sustainable performance calculated by $(I_{S1}, I_{S2}, I_{S3}\ and\ I_S)$. In the same way and based on this evaluation module,we can also classify all best practices of a logistic chain following their sustainability.

V. Conclusion

The purpose of this article is to show the difficulties in measuring sustainable performance, fuzzy concept, presented by many authors as aggregation of

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economic, environmental and social performance of a firm.

While sustainability information is typically treated separately, this paper tries to translate it into a form that corresponds to needs of decision-makers. This paper illustrates that it is possible to assess sustainable development in an integrated way that provides good guidance for decision-making. As the business case for sustainable practices becomes increasingly clear, sustainability reporting offers a measurable value to those whose business is to assess the current sustainability health of firms and influence future action. At present, content of sustainability reports tends to appear in forms and units that are not readily convertible into unique terms. The model presented in the paper promises advance in sustainability assessment of logistic chain and makes sustainability information more useful to decision-makers. Core and supplemental indicators (I_{S1}, I_{S2}, I_{S3}) when combined into composite sustainable development index (I_S) can be used to reflect the achievements of logistic chain towards sustainability.

Even though further development is called for, it is evident that this model for sustainable development assessment has the potential to become very useful as one of the tools available. The combination of better assessment methods is likely to continue this movement towards a new generation of integrated sustainability performance reports.

VI. Acknowledgments

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Conflict of Interest Statement

The two authors certify that they have *NO* affiliations with or involvement in any organization or entity with any financial interest, or non-financial interest in the subject matter or materials discussed in this manuscript.

References Références Referencias

1. Babai, M.Z. (2005), "Politiques de pilotage de flux dans les chaînes logistiques : impact de l'utilisation des prévisions sur la gestion de stocks", Thèse de doctorat, Ecole Centrale, Paris, 30 Novembre.
2. Genin, P. (2003), "Planification tactique robuste avec usage d'un A.P.S –. Proposition d'un mode de gestion par plan de référence", Thèse de doctorat, Ecole des Mines, Paris, 18 Decembre.
3. Simchi-Levi, D., Kaminsky, P. and Simchi-Levi, E. (2000) Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies. Irwin/McGraw-Hill., Boston.
4. Galasso, F. (2007), "Aide à la planification dans les chaînes logistiques en présence de demande flexible", Thèse de doctorat, Institut National Polytechnique, Toulouse, 23 Avril.
5. Gruat L. (2007), "Référentiel d'évaluation de la performance d'une chaînelogistique - Application à une entreprise de l'ameublement". Thèse de doctorat en Génie Industriel, Institut National des Sciences Appliquées, Lyon, 6 Decembre.
6. Singh, R. K., Murty, H. and Dikshit, A. (2009), "An overview of sustainability assessment methodologies", *Ecological Indicators*, 9(2):189-212.
7. Linton, J.D., Klassen, R. and Jayaraman, V. (2007), "Sustainable supply chains: An introduction", *Journal of Operations Management,* 25(6):1075-1082.
8. Gold, S., Seuring, S. and Beske, P. (2010), "Sustainable Supply Chain Management and Inter-Organizational Resources: A Literature Review", *Corporate social responsibility and environmental management*, 49(4):230-245.
9. Veleva V., Hart M., Greiner T. and Crumbley C. (2001), "Indicators of sustainable production", *Journal of Cleaner Production*, 9(5):447–452.
10. Veleva, V. & Ellenbecker, M., (2001), "Indicators of sustainable production: framework and methodology", *Journal of Cleaner Production*, 9(6):519-549.
11. Tahir, A.C. and Darton, R.C. (2010), "The Process Analysis Method of selecting indicators to quantify the sustainability performance of a business operation", *Journal of Cleaner Production*, 18(16-17):1598-1607.
12. Zhu, Q., Sarkis, J. and Lai, K., (2007a), "Green supply chain management: pressures, practices and performance within the Chinese automobile industry", *Journal of Cleaner Production*, 15 (11-12):141-1052.
13. Zhu, Q., Sarkis, J. and Lai, K. (2007b), "Initiatives and outcomes of green supply chain management implementation by Chinese manufacturers", J ENVIRON MANAGE, 85(1):179-189.
14. Lindgreen, A., Swaen, V. and Johnston, W. (2009), "Corporate Social Responsibility: An Empirical Investigation of United States Organizations", ⁋ J. Bus. Ethics, 85(2):303-323.
15. Krajnc, D. and Glavic, P. (2005), "A model for integrated assessment of sustainable development", *Resources, Conservation and Recycling*, 43(2):189-208.
16. Singh, R.K. (2007), "Development of composite sustainability performance index for steel industry", *Ecological Indicators*, 7(3):565-588.
17. Roy, B. (1985) Méthodologie multicritère d'aide à la décision. Economica, Paris.

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18. Bronet, V. (2006), "Amélioration de la performance industrielle à partir d'un processus référent - Déploiement inter entreprises de bonnes pratiques",Thèse de doctorat, Université de Savoie, Annecy le Vieux, 22 Septembre.
19. Forman, E.H. & Gass, S.I. (2001), "The analytic hierarchy process-an exposition", *Journal of Operations Research,* 49(4):469-486.
20. Dyer, J.S. (1990), "Remarks on the analytic hierarchy process", *Manag. Sci.* 36(3):249-258.
21. Saaty T.L. (1980) Analytical Hierarchy Process: Planning, Priority Setting, Resource Allocation. McGraw-Hill, NewYork.
22. Baumann, E. (2011), "Modèles d'évaluation des performances économique, environnementale et sociale dans les chaînes logistiques", Thèse de doctorat, Institut National des Sciences Appliquées, Lyon, 10 Mai.
23. Hafeez K, Zhang Y, Malak N. 2002. Determining key capabilities of a firm using analytic hierarchy process. *International Journal of Production Economics* 76(1): 39–51.
24. SCC (2008) Supply Chain Operations Reference Model. IEEE Computer Society, Texas.
25. Tarcisio, A.S. and Cléber F. F. (2009), "The impacts of lean production on working conditions: A case study of a harvester assembly line in Brazil", *International Journal of Industrial Ergonomics*, 39(2):403-412.

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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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