ISSN 1548-6591 (Print)
ISSN 1935-9691 (Online)
DOI:10.17265/1548-6591

DAVID PUBLISHING

From Knowledge to Wisdom

Journal of US-China Public Administration

Volume 17, Number 2, Mar.-Apr. 2020

David Publishing Company
www.davidpublisher.com

Journal of US-China Public Administration

Volume 17, Number 2, Mar.-Apr. 2020 (Serial Number 146)

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Publication Information:
Journal of US-China Public Administration is published bimonthly in print (ISSN 1548-6591) and online (ISSN 1935-9691) by David Publishing Company located at 3 Germay Dr., Unit 4 #4651, Wilmington DE 19804, USA.

Aims and Scope:
Journal of US-China Public Administration, a professional academic journal, commits itself to promoting the academic communication about analysis of developments in the organizational, administrative and policy sciences, covers all sorts of researches on social security, public management, educational economy and management, national political and economical affairs, social work, management theory and practice etc. and tries to provide a platform for experts and scholars worldwide to exchange their latest researches and findings.

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Editorial Office:
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Tel: 1-323-984-7526; 323-410-1082 Fax: 1-323-984-7374; 323-908-0457
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Abstracted / Indexed in:
American Federal Computer Library Center (OCLC), USA
CNKI (China National Knowledge Infrastructure)
Index Copernicus, Poland
Chinese Database of CEPS
Chinese Scientific Journals Database, VIP Corporation, Chongqing, P.R. China
Google Scholar, WorldCat, CrossRef, CQVIP
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Subscription Information:
Print $560 Online $360 Print and Online $600 (per year)
For past issues, please contact: shelly@davidpublishing.com, order@davidpublishing.com

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Journal of US-China Public Administration, Mar.-Apr. 2020, Vol. 17, No. 2, 43-56
doi: 10.17265/1548-6591/2020.02.001

The Citizen Support Portal

Bilkiss Rajahbalee-Cader, Suraj Ramgolam, Doorga Nundram
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In August 2015, Government of Mauritius developed "Vision 2030", which is a key policy document that charts out the path to transform Mauritius into a high-income, sustainable, innovative, and inclusive economy with modern infrastructure, global connectivity, and advanced skills and technology. In line with "Vision 2030", government has elaborated, with the assistance of the Commonwealth Secretariat, a Public Sector Business Transformation Strategy, which is built around 10 implementation pillars and which has as main objective to promote and implement a holistic reform and business transformation framework for the public service in Mauritius. It is in this context that the Prime Minister's Office implemented a Citizen Support Portal (CSP) in April 2017 to place the citizens at the centre of government services delivery by bringing a radical transformation in the process of managing complaints and suggestions received from the public. The CSP enables the citizens to register their complaints/suggestions/general inquiries online on the web address (www.csu.mu), which is subsequently dealt with in a transparent, rule-based, efficient, and timely manner. This government-to-citizen interaction has earned the Citizen Support Unit (CSU) recognition by the Commonwealth Association of Public Administration and Management (CAPAM), the African Association of Public Administration and Management (AAPAM), and at local level with the conferment of the Silver Award at the Public Sector Excellence Awards 2018 amongst others. With its advanced data analytics tool, the CSP enables detailed analysis of complaints and suggestions in order to ensure the production of statistics for government and the public, monitoring and evaluation, planning, informed decisions, as well as policy formulation. Backed by regular media campaigns and radio programmes, the initiative of the CSU has been a resounding success with 83% of cases resolved to the satisfaction of the citizens out of a total of around 91,000 tickets received to date.

Keywords: citizen centric, empowerment, all-inclusive, sustainable, transparency, accountability

Introduction

The public sector remains the bed rock for the socio-economic development and prosperity of a country. As a matter of fact, the role played by government machinery in implementing the objectives set out in the United Nations Sustainable Development Goals and Agenda 2063 of the African Union cannot be underestimated.

However, it is observed that public reform programmes and initiatives in the African Continent and

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undertaken under the Structural Adjustment Programme of World Bank since the 1980s have had a mitigated effect in sustaining the socio-economic development of the continent. The performance of such reforms in Africa remains hindered by a myriad of factors, including lack of efficiency, lack of accountability, ineffective management practices, and corruption.

Whilst the benefits of Structural Adjustment Programmes brought by Government of Mauritius has enabled the country to be elevated from a mono-crop low income economy in the 1970s to a vibrant, resilient, and diversified services based economy, such strategy has proven its own limitations. As a matter of fact, Mauritius has for the past decades remained in what economic experts term as a “middle-income economy” trap situation. It has become therefore crucial for Government of Mauritius to bring about a paradigm shift in strategies adopted in various sectors of socio-economic activities to meet the ambition of the country in joining the league of high income economies in the next years. The reform initiative which is presently unfolding and in line with the Public Sector Business Transformation Strategy approved by government in February 2017 aims at fostering the concept of “New Public Management (NPM)”.

New Public Management is a label used to describe a management culture that emphasizes the centrality of the citizen or customer underpinned by the accountability for results.

It is a set of broadly similar administrative doctrines, which dominated the public administration reform agenda of most OECD countries from the late 1970s (Hood, 1991; Pollitt, 1993; Ridley, 1996) (Khaled, Chowdhury, 2010, p.44). It captures most of the structural, organizational, and managerial changes taking place in the public services of these countries, and a bundle of management approaches and techniques borrowed from the private-for-profit sector.

The implementation of the Citizen Support Portal (CSP) by the Citizen Support Unit (CSU) is a true reflection of the NPM model which is in direct opposition to the traditional model of organization and delivery of public services, based on the principles of bureaucratic hierarchy, centralized planning, and direct control.

The NPM modelled by the CSU provides for smaller, faster-moving service delivery organizations that is kept nimble and lean and that would need to be user-responsive and outcome-oriented in order to succeed. Such set up has developed flatter internal structures (i.e., fewer layers) and devolved operational authority to front-line managers across more than 300 government entities connecting to the CSP. With a downsized number of staff, many services are contracted out instead of assuming that in-house provision is best.

Rationale of the CSP

In February 2017, a survey was conducted across all the 24 Ministries of Government in order to gauge how complaints and suggestions were being handled in the public sector. Ministries responded with outcomes clustered around a system riddled with bureaucracy wherein complaints were recorded and processed manually relying on a paper intensive method and out of date business processes. It was also observed that the processing of certain complaints was taking undue time with the occurrence of lost/misplaced files or documents.

Against such a bleak situation, government was called upon to take a bold stand and strive to establish a high standard in public service delivery system and process for people seeking government services irrespective of their social position, geographical location, race, and other differences. However, in order to build an all-inclusive society, it is primordial to hear the voices of the poorest and the most vulnerable and take the right step to enable them join the mainstream of socio-economic development.

Objectives of the CSP

- Evaluate how CSP can contribute in efficient, round the clock, and timely citizen centric public service delivery by adopting innovative technologies.
- Explore how participatory development connected the citizens and state for more informed decision making at the highest echelon of the government.
- Analyze to what extent CSP has reinforced organizational learning, accountability, transparency, and efficiency in the public system.
- Analyze how CSP has created a single window for operations, monitoring and evaluation, reporting, communication and IT operations to examine citizens' needs and for policy formulation in government service delivery.

Advent of the CSP

The CSP, which is operational since April 2017 has been developed and hosted by Mauritius Telecom (MT), the largest telecommunication provider of the island. It is based on open source and extremely affordable technologies (i.e., Php, MySQL database) which has been customized in accordance to the requirements of the government in regards to complaints/suggestions management.

The online CSP platform allows any citizen to register their complaints/suggestions/general inquiries online on the web address (www.csu.mu) through their smartphones/laptops/tablet. Once a citizen registers his/her complaint/general inquiry/suggestion, a ticketing system operates to provide the end user with a unique ticket number for tracking and reference purposes through SMS notification.

Any citizen can avail of this facility even for those who do not have the means to register a complaint/suggestion on their own. They can simply approach one of the 35 offices of the Citizen Advice Bureau (CAB) located across different regions of the island. There is a dedicated CAB officer who provides assistance and advice to the citizens and coordinates with the various government agencies to get the status of the ticket being processed. Also, citizens can use this internet based platform across the 95 post offices of the island. As for those visually impaired, the CSP has inbuilt features to allow them to use the platform comfortably. CSP is indeed an indispensable support for the citizens as it is operational on a 24/7 basis.

CSP has also been launched in Rodrigues, a dependency island of the Republic of Mauritius. The system is managed by the Rodrigues Regional Assembly and customized in its local context.

The CSU

The CSU operates under the aegis of the Prime Minister's Office and is the central body which manages the CSP and ensures that complaints and suggestions received are handled in an efficient and timely manner. The unit comprises of different sections having their share of responsibility to meet the desired objectives and these are namely the operation and training, monitoring and evaluation, marketing and communication, technical (IT) and statistics sections. In all there are 14 officers who work at the CSU with different professional backgrounds and expertise.

How the CSP Operates?

The process of registering complaints/suggestions/general inquiries is markedly different from what it used to be prior to launching the CSP. There has been a radical change in the business processes, organizational

arrangement, and resource management.

How users register their complaints on the online platform (www.csu.mu) to how complaints are processed and feedback obtained from customers is clearly depicted in Figure 1.

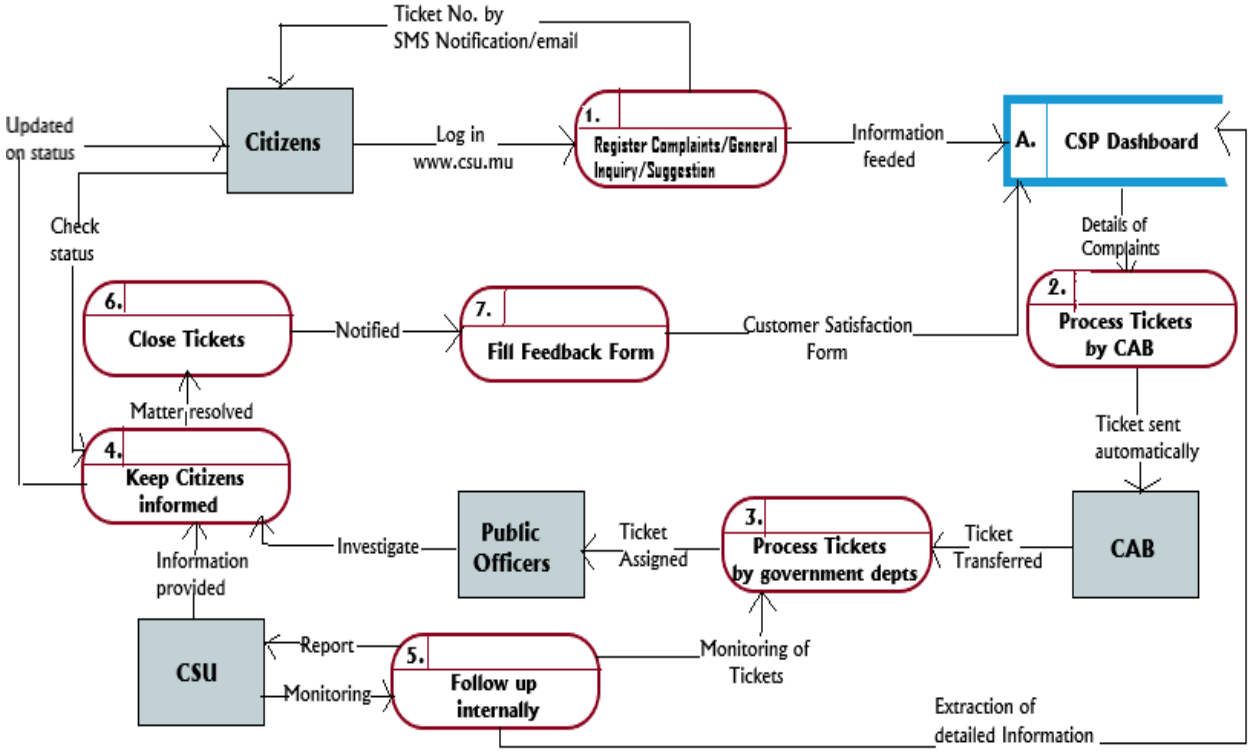


Figure 1. Process of Complaint Management of the CSP (Source: CSU).

Registering the Complaint/General Inquiry/Suggestion

The citizen makes a new request on the CSU website (www.csu.mu) or walks in to 1 of the 35 CAB or 95 post offices to register his/her complaint/general inquiry/suggestion online. Once the online form is filled and the nearest CAB specified, a unique ticket number is provided to him/her by email or on his mobile phone.

Processing of the Ticket by CAB

Based on the CAB specified in the online application form, the complaint/general inquiry/suggestion is subsequently automatically transferred to the CAB office. Thereon, the CAB will direct the ticket to the relevant government body for necessary actions at their end. There are 300 participating government entities/departments on the CSP.

Processing by the Government Body

When a complaint or suggestion has been duly transferred to a government body, a high ranking officer, the department supervisor, who is responsible for handling of complaints or suggestions, takes ownership of same. The department supervisor can personally address the complaint or suggestion or he/she can assign the complaint to one of his subordinates, the department officer.

The suggestion or complaint can be reassigned to another department officer or transferred electronically to another government body where the same process as described above is adhered to.

During processing, the citizen may be contacted by phone or notified by email. Once the complaint or suggestion has been dealt with, the ticket is closed and the citizen is automatically notified.

Internal Follow Up

The Citizen Advice Bureau and CSU officers, as well as officers of a given government organisation have the possibility to monitor, query officers, or post an internal note on the CSP during the processing of complaints or suggestions.

The CSU of the Prime Minister's Office has dedicated officers to follow up on all complaints received on the portal and intervene promptly to ensure that citizens are provided with the quality government services at all times.

Keeping the Citizen Informed at All Times

The CSP provides for the citizen to be informed by email during the processing phase of the complaint or suggestion. The citizen receives an email when his ticket has been closed by the government body dealing with the complaint or suggestion

Checking Status

The citizen can at any time check the status of his/her complaint by providing the ticket number received when the post was first made.

Feedback

Once a ticket is closed, the citizen is invited to fill in a feedback from where he/she will have the opportunity to provide relevant comments and rate the level of service obtained.

Benefits of the CSP

Round the Clock and Inclusive Service

Making complaints used to be a stressful, tedious, and unwelcoming activity in the earlier days. But now by putting digital government at the forefront, the CSP has encouraged citizens to use a service available at the click of a button without any time or physical constraint.

Also, there are citizens approaching the CABs to avail of this service and during this interaction rapport is built with the citizens. They are informed about the public services and procedures, encouraged to share their issues and overcome the fear of consequences.

Accountability and Transparency

Tickets registered are treated on a first come first serve basis. Updates on the status of the ticket can be tracked by the citizen through the ticketing number and even officials can monitor progress and the efficiency of a service they provide. Through this approach, effective delegation and accountability is now a reality.

Upholding Confidentiality

The protection of personal data handled by the CSP is an essential condition in upholding trust and confidence among users. The CSU, therefore, ensures that complaints and suggestions that are received on the CSP are treated in strict confidentiality by authorized officers in strict compliance with the Data Protection Act. Moreover, the CSP has been developed to include strong and resilient protective security features which comply with internationally benchmarked cyber security standards.

Organisational Learning and Upgrading the Skills of Officers

It is remarkable how CSP has been able to drive radical change in behavior and working culture of the public sector. By having onboard all the government entities and creating the sense of belonging and responsibility, CSU has put organisational learning at the forefront. Public officers are continually trained and are made to accept and recognize the importance of adapting to changes.

CSU ensures that their skills are upgraded and in line with the objective of the CSP which is aligned with that of the government. The public institutions are well coordinated and communication flow across government entities for informed decisions.

Public Trust and Reduced Scope of Nepotism

The CSP enables every citizen to be treated indiscriminately irrespective of his origin, social status, locality, or creed. This is a key factor in creating a trustful environment for an enhanced government-citizen interaction. Furthermore, the citizen has now an opportunity to be aware at all times about the status of his/her complaint or suggestion as well as obtaining an update from the officer handling the case while in process.

Methodology

It is an undeniable fact on how the CSP has generated actionable, accurate, and strategic insights since its coming into operation in 2017. The implementation of the much awaited change was underpinned by the lean yet strong organizational setup of the CSU as has been illustrated in Figure 2.

Figure 2. Pillars of the CSU (Source: CSU).

Unleashing innovation and transformation efforts in the public sector has yielded results which are beyond expectations. Through the rigorous tasks and endeavours of the knowledgeable, experienced, and competent

teams at CSU, researches pertaining to the broad spectrum of CSP's influence in citizens' lives are undertaken. Both quantitative and qualitative data are generated to gauge the achievements of its set objectives. Different methods have been explored to add value to the monitoring and evaluation of its social, organizational, and economic obligations.

Reports From CSU Dashboard and Kibana Data Analytic Tool

The complaints registered on the online platform are captured in the CSU databases namely CSU Dashboard and Kibana Dashboard. The data filled in the form by the citizens are distilled in informative and comprehensible data fields. In this way, the numbers of tickets pertaining to each Ministry, Constituency, and/or Department are extracted and sorted as per timeframe, ticket status/types and according to the needs of the relevant stakeholders. Recently, CSP was upgraded with 254 complaint categories (main and sub) so that each ticket registered could be classified according to the nature of the issue. These help CSU and government entities to derive detailed information and steer actions towards the identified problem areas.

From the data on dashboards, statistical reports are prepared by CSU to identify the different issues affecting citizens' lives, examining the priority areas, making recommendations on how to tackle those issues, and improving public service delivery. Quarterly reports are submitted by CSU to the Cabinet of Ministers comprising of in-depth analysis and recommendations. Hence, monitoring and evaluation is done at the highest echelon of the government. Ministries are also encouraged to submit monthly reports to the Cabinet. The statistics become the fundament for decision making. Framing the problem areas of citizens is in fact the vital base for policy making, budget allocation, and defining programmes and activities for the government.

Investigative Research Through the Right Mix of Communication Strategies

Fending for participatory development and for the needs, safety, and happiness of the population requires the outgrowth of open and responsive communication practices. The right mix of impactful communication and marketing strategies have undeniably supported this major project in being accepted, used, and continuously upgraded. The communication campaigns have helped enormously in building up credibility and comprise of the following:

- Since April 2017, the CSU has embarked on a vast communication campaign in order to cover the whole population and to ensure that the citizens are made aware of their rights and benefits provided by government;
- Radio programmes twice per week (Tuesdays and Saturdays) which comprise interaction with citizens to resolve their complaints and sensitize the population and procedures and policies of the government in all sectors;
- Weekly TV programmer every Thursdays broadcasted on MBC TV channel during peak time to bring solutions to the problems faced by vulnerable persons;
- Sensitization campaigns by the Task Forces live on radio in each region across the island and in shopping malls to ensure more proximity with the citizens;
- Broadcasting of video clips showing new and innovative features on the portal on the national television for more awareness and video clip on CSU song;
- Active on social media platform namely Facebook and YouTube.

Creating platforms to encourage citizens to come and share vital information has aided CSU in delving into realities which might not have gained so much attention previously and which require quick intervention even if they affect only minority groups in particular regions. In fact, the face to face interaction

during CSU campaigns contributed immensely in finding out the kind of expectations citizens have from the government, their opinions on the quality of public services then and now and creating greater proximity than ever before.

In the same vein, since July 2018, the government has set up Task Force Meetings chaired by Parliamentary Private Secretaries to monitor closely the issues prevalent in their respective electoral constituencies and find out viable solutions. The representatives from different government entities attend the meetings to monitor progress and undertake discussions to sort out intricate matters. Till date, more than 190 Task Force Meetings have been conducted pointing towards the positive impact it is having on matters reported.

Document Review of Different Activities of CSU

Orchestrating the interaction with more than 300 government departments and coordinating efforts towards resolving the tickets has been one of the most significant aspects of the operation team of CSU. Embedding the use of innovative technologies required the mobilization of savvy talents with the right skills set and attitude. Documenting on the training needs of the public officers to use the portal and efficiently handle issues was implemented.

Till date, more than 1,200 public officers have been provided with the necessary ongoing training to acquire the right and upgraded skills in using the platform and for effective service delivery. Meetings and workshops are held from time to time challenging public officers to break through the conventional way of functioning and pushing them beyond the boundaries of their comfort zones. Emphasis is being laid on building greater connectivity, ensuring effective communication, and lifting up the notion of accountability, transparency, and efficiency through close monitoring of tickets.

System Analysis for the Upgrading of Service Provision

Besides, the CSU has made an informed choice to use free and affordable open source software (PhP and MySQL) development platform for the implementation of the CSP. Through the technical expertise of staff and coordinated efforts with MT this project was successfully completed with a short time frame while at the same time opening avenues for the harnessing of innovation in other areas of public administration. Through regular meetings with MT, discussions are undertaken on how to innovate further to meet the requirements of different stakeholders and any trouble shooting issues are tabled.

Findings: Reports on CSP and Recommendations

Since the inception of CSP, due consideration has been given for the relief in the life of citizens through the provision of efficient delivery of public services by adhering to the principles of good governance. The task of CSP was not bounded only by just developing a one click transaction system, receiving and closing tickets, but the impact of the whole process on the society that matters.

Against the backdrop of its vision and objectives, CSP has been tapping on the real time data for an impact-based evaluation on how successful it has been in creating the desired outcomes. On a monthly basis, statistics of the CSP are prepared by the Business Information Unit and uploaded on the CSU website highlighting on the cases resolved, percentage of cases in each constituency, top categories of problem areas, and representation of age and gender. The statistics as at 31st July 2019 have been illustrated in Figure 3.

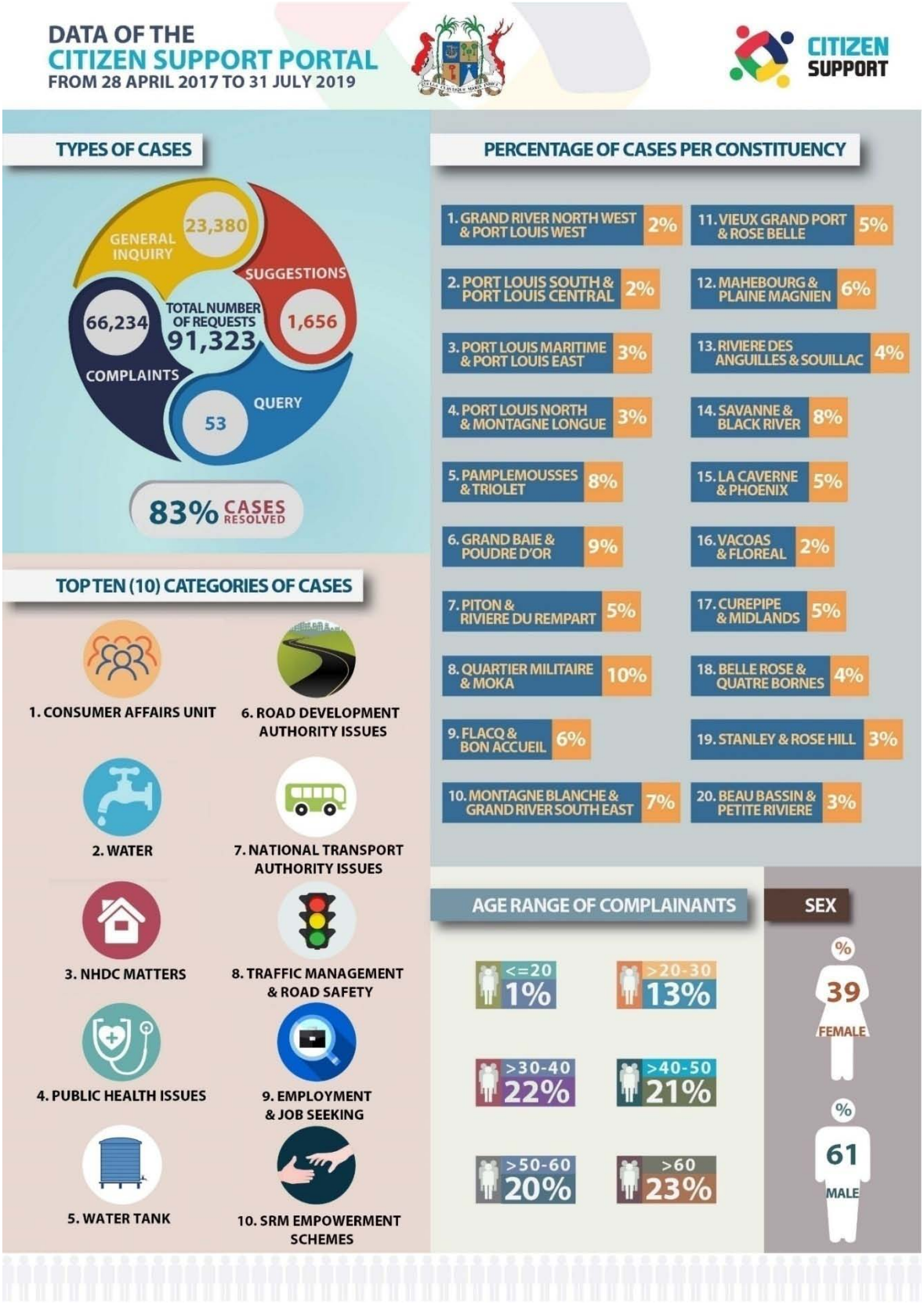


Figure 3. Statistics of CSP as at 31 July 2019 (Source: CSU).

As can be seen in Figure 3, a total of 91,323 tickets were received on the CSP with 83% cases resolved. This pinpoints to the extent of CSP being embraced and used by the Mauritian population across different regions of the island. Efforts are being harnessed to help citizens find solutions and pare down scourging situations. By identifying the top categories of complaints, crucial issues are reported to higher levels of the government for decision taking and better execution of responsibilities. Further investigations are conducted to scrutinize the causes of issues pertaining for instance to consumer affairs, water, national housing development council matters amongst others, probe into the segments of the population being affected, what actions are required, and the different stakeholders concerned.

In view of the quarterly reports which are prepared by the monitoring and evaluation team of CSU and submitted to Cabinet of Ministers, in-depth analysis was done to have an insight into not just pertinent issues affecting the lives of citizens but systemic concerns as well. For instance, following more than 190 Task Force Meetings across the 20 constituencies of the island, the 2nd Task Force Meeting Report was prepared for the period July 2018 till May 2019. The positive impact of the Task Force Meetings has been remarkable; the number of total resolved tickets on CSP soared from 70% to 80%. This novel government tactic of reporting these matters has unlocked possibilities of improving service delivery. Government entities are made to investigate on the constraints they are facing in addressing issues which can emanate from areas like human resources, financial or legal.

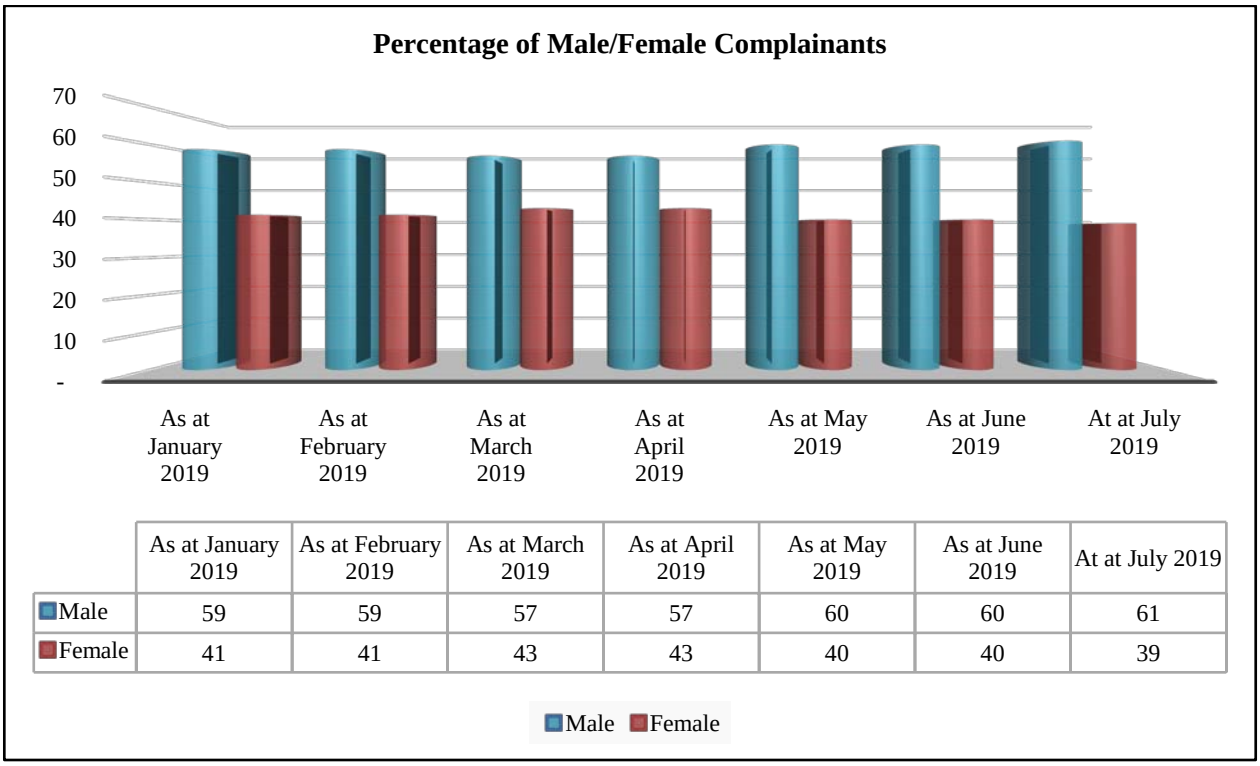
Additionally, recommendations were made on how to improve the existing system and devising strategies to fill in the gaps. The report highlighted on crucial areas like the quality of service and process to reinstate the trust of each and every citizen. It was pertinent to explain to the citizens the complaint handling process and provide them with clear feedback once a particular investigation was completed. Besides, it was proposed to have a community welfare plan at the level of each constituency for the development of essential programmes and activities region-wised fostering a harmonious society.

Also, 254 complaint categories have already been integrated in the system for detailed statistics. In furtherance to this latest development, a new exercise is currently in progress to obtain the Service Level Agreements for each category from Ministries/Departments. This will help establish a pre-defined and reasonable timeframe to handle and resolve a particular category of complaint. To stay in the fast track lane and for sweeping advances, each and every public officer will have to been encouraged, motivated, and trained to realize the call of his/her responsibility.

As far as participatory development is concerned, gender equity is a requisite and it is commendable that CSP has become a platform which has sparked the participation of women in the public sphere. In its catapult for wider outreach, the CSP has been engaging in such communication and marketing strategies that has helped to bridge the gap not only between the state and the citizens but also, derive a fair representation of women in using the CSP as has been illustrated in Figure 4.

As can be seen from the diagram, the representation of male varies from 57% to 61% compared to female which is between 39% and 43%. Based on the latest data pertaining to the period as at July 2019, the difference between male and female complainants extended to around 11%. Hence, participatory development has been promoted with an all-inclusive approach.

The information/data gathered from the Kibana Dashboard pertaining to the period 1 January 2019 to 31 May 2019 sheds light on the context-specific differences that exist between gender relations and their social and economic conditions as can be seen in Table 1.



	As at January 2019	As at February 2019	As at March 2019	As at April 2019	As at May 2019	As at June 2019	At at July 2019
Male	59	59	57	57	60	60	61
Female	41	41	43	43	40	40	39

Figure 4. Percentage of male/female complainants (Source: CSU).

Table 1

Top 10 Categories of Issues for Male and Female Complainants (Source: CSU)

Top 10 categories of issues for the period 1 January 2019 to 31 May 2019			
Male	(%)	Female	(%)
Street lighting	9.2	Water	8.2
Drains & road infrastructure	9.2	Housing	6.9
Water	9.0	SRM empowerment scheme	6.5
Consumer affairs unit	7.4	Cleaning of bare lands & derelict buildings	6.4
Cleaning of bare lands & derelict buildings	5.8	Consumer affairs unit	5.8
Building and permits & planning & trade fee	5.8	Drains & road infrastructure	5.4
Housing	3.7	Street lighting	4.6
Public health issues	3.3	Building and permits & planning & trade fee	3.5
Police	3.1	Public health issues	3.2
Road development authority	3.0	Employment & job seeking	2.6

These statistics provide insights on the division of work, responsibilities, and power and the interlock patterns of opportunities, disadvantage, or deprivation which can help in defining policies, budgets, and programmes from gender lens.

Besides, the CSP is operated under a robust, reliable, and secure ICT Infrastructure which is a key condition for a project of this scale. The implementation of the CSP across all government entities has been possible as the necessary infrastructure such as the MT Data Centre, the Government Intranet System, and necessary computing tools at the level of users were readily acquired by the CSU. Reports comprising log in information of public officers and enquiry on how tickets are processed clearly indicate the level of

commitment that they are showing. The focus is transforming from just the routine administrative tasks to coordinate to achieve national targets through communication that cuts across ministries and departments.

Discussion: Major Steps and Achievements

The spectacular growth of CSP has been fueled not just by the restricted vision of delivering citizen centric services but has gone well beyond that motive. CSU has challenged its own limit by collaborating with various stakeholders and meticulously devising new ways to nurture the self-development of a citizen as a whole in a harmonious society. Figure 5 shows the different stakeholders of CSU.

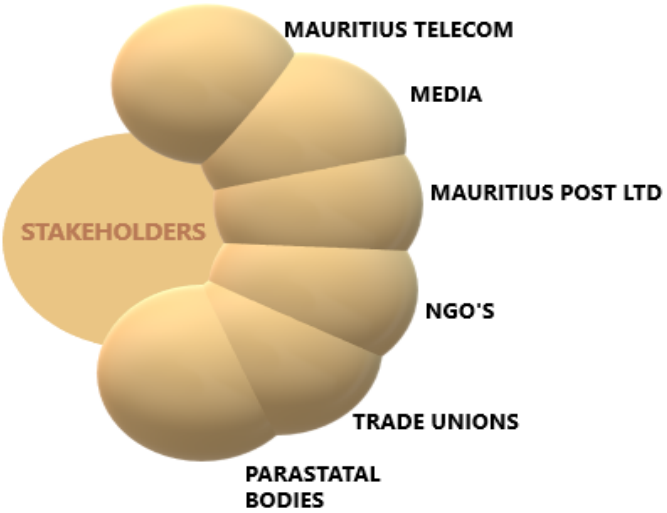


Figure 5. Stakeholders of CSU (Source: CSU).

A crucial step was made by CSU in being part of the National Emergency Operations Command for disaster risk reduction. The Portal is used to facilitate lifesaving communications in reaching appropriate bodies for prompt actions. In addition, CSU has been collaborating with NGO's to combat societal afflictions and help vulnerable groups find cogent solutions. Through the media, the citizens are sensitized and bold steps taken for result oriented interaction and setting the trail for others to follow. All these have been possible through the joint work of various stakeholders.

A thick demarcation line has been created for CSU from being an entity prevalent just for complaints management to englobing the all-round development of a citizen. CSU is involved in major projects of the country like:

- "Moris Nou Zoli Pei" (Mauritius my beautiful country)—In collaboration with the Ministry of Local Government and Outer Islands, National Cleaning and Embellishment Campaigns were carried out across different regions to spark the concept of cleanliness and sustainability and were still an ongoing project.
- "Active Mauritius Debark KotTwa" (Active Mauritius comes to you)—In collaboration with the Ministry of Youth and Sports, various activities will be held across the island encouraging people of different age groups to participate and seed the notion of healthy activities, eating and ageing.
- Domestic Violence—In collaboration with the Ministry of Gender, Child Development and Family Welfare efforts are being directed to help victims, educate citizens, and combat violence through training of CAB officers, video clips, and workshops.

With regard to the journey CSP has accomplished so far, it is undeniable how it has successfully innovated in different areas which have been depicted in Figure 6.

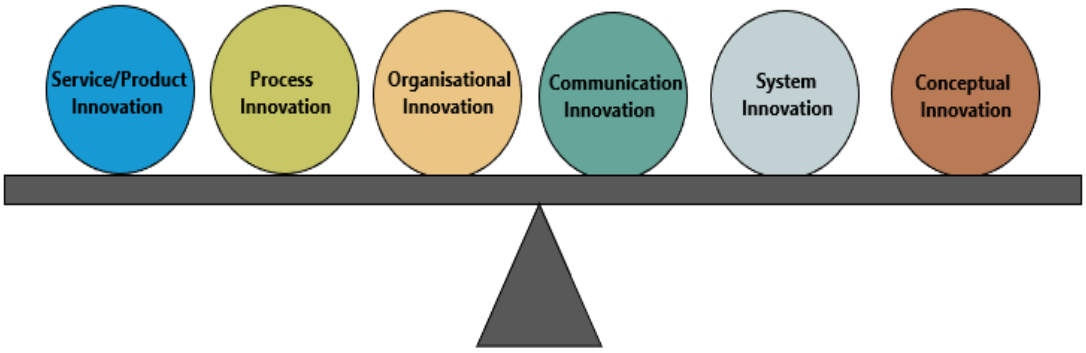


Figure 6. Areas of innovation (Source: CSU).

It can be rightfully said that the scope of expanse of the CSP has been indeed remarkable since its emergence and in fact, it is progressing at lightning speed. The project has won the Bronze Award at the African Association for Public Administration and Management (AAPAM) Award. Hence, even at international level, CSP is inspiring nations. The African Development Bank has shown interest to replicate this type of project in African countries. CSU will be participating in the 2nd International Conference in Uganda revolving around the concept of good governance and public service delivery.

Conclusions

The culture of continuous improvement is deeply ingrained in this project. Navigating new frontiers to unleash both economic and social values will always be a top priority for CSP. It is important to understand that when a project at the level of the government is undertaken for the citizens, there has to be the right blend of economic, social, and holistic perspectives throughout which responsive strategies are devised and implemented. This is not about competition with others but all about competing with the current difficult situations to shape a better tomorrow.

There is more to explore for CSP and elevate its level higher by reaching out the most vulnerable groups and making the society free from hunger, poverty, pollution, crimes, and problems affecting the lives of citizens. The battle against hard core realities will be ongoing and this requires a consolidated nation. More projects and collaboration will be needed for effective community building not just whereby authorities are resolving citizens' issues but creating a society where citizens help themselves. The growing delivery capabilities of CSP have no bound if each stakeholder strives for optimum performance in a connected world.

Acknowledgement

The CSP Project became a reality due to the unfaltering belief and efforts of the whole CSU Team and the support of each and every stakeholder. The well balanced CSU team has made excellence a habit in every task being undertaken to move towards the vision set for the country. The journey till so far has been enriching and revitalizing in the quest of continual innovation and progress.

The initiation of the project, keeping and working together to realize a dream came true, was all thanks to the vision of the Prime Minister's Office, hard work of the CSU, CABs and government agencies, expertise

contribution of MT, support of the Media, NGO's, Trade Unions, Parastatal bodies, and the expectations and hope of the citizens.

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Journal of US-China Public Administration, Mar.-Apr. 2020, Vol. 17, No. 2, 57-62
doi: 10.17265/1548-6591/2020.02.002

Compensation Policies of Japanese Employers' Organizations From 1990s to 2000s: What Changed or Not?

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This paper examines the compensation policies proposed by Japan Federation of Employers' Associations (NIKKEIREN), especially focusing on the "regular wage hike system (Teikisyokyu)". NIKKEIREN has proposed to its members of Japanese employers many kinds of compensation system, such as pay for performance or multi-path pay scheme based on "employment portfolio". As shown in the change of NIKKEIREN's policies in 1990s, the appearance of Japanese compensation system looked drastically changed, comparing with that of 1980s, which was usually known as the "seniority wage system". However, there is one thing that Japanese employers' organization does not give up: the regular wage hike system. The essential reason was that it was regarded as the indispensable element to keep the employee's order in a Japanese company's organization. The paper investigates the detail of the compensation policies of NIKKEIREN and makes it clear how the Japanese employers' organization tried to update the regular wage hike system, especially taking up the era of 1990s and 2000s when Japanese employment systems changed.

Keywords: regular wage hike system, the hike by personnel appraisal, the automatic hike, pay for performance, pay for role, pay for seniority, pay for ability, employment portfolio

Preface-Research Questions and the Background

The research question of this paper is to confirm the function of "regular wage hike system" (Teikisyokyu) since 1990s in Japan. Many kinds of compensations policies have been proposed in Japan since the end of World War II. However, "regular wage hike system" has been at the center of Japanese compensation policies for half century. This paper makes clear why it has survived even in the era of "pay for performance" and other compensation policies proposed since1990s.

A lot of scholars said that Japanese compensation policies drastically changed since 1990s. For example, Dr. Mitsuo Ishida (2009) explains that Japanese compensation policies changed from supply-side (internal labor market) oriented to demand-side (external labor market) oriented recently. As a result, Ishida says that Japanese employers found "pay for role" (Yakuwarikyu) compensation policy, which is closely related to market economy.

However, Ishida's definition of "pay for role" is different from Japanese employers who really run personnel management. Of course, employers are conscious of market economy more than ever. But "pay for role" is more comprehensive idea than Ishida indicated: "Pay for role" is a kind of "melting pot" of Japanese employers' compensation policies.

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This paper discusses the detail of the compensation policies of Japanese employers represented by NIKKEIREN and makes it clear how the Japanese employers' organization tried to update the regular wage hike system, especially taking up the era of 1990s and 2000s when Japanese employment systems changed. Through the process, it is confirmed that "regular wage hike system" is the most important factor and regular wage hike system conquers all the Japanese compensation policies, including "pay for performance" and "pay for roles" in 1990s and 2000s.

Firstly, some statistics should be checked. Figure 1 shows the chronicle of wage hike of Japanese companies. Until 1990s, the share of base up was very high, thanks to Japanese economic growth. But it has been shrunk for 20 years; nowadays almost zero. On the other hand, regular wage hike has been constant: 5% in 1960s and 2% since 1970s. Since 1990s, Japan has suffered from prolonged deflation. As a result, base up is very difficult for Japanese employers, because it puts severe pressure on compensation management. But Japanese employers have preserved regular wage hike system, even in stagnated economic conditions.

Figure 2 shows the share of the factors in regular wage hike. The share of appraisal has been highest though all years. Job and rank are also included partly in appraisal, because it is a result of appraisal, while "genuine" appraisal's share is recently increasing. The part of automatic(s) has been constant.

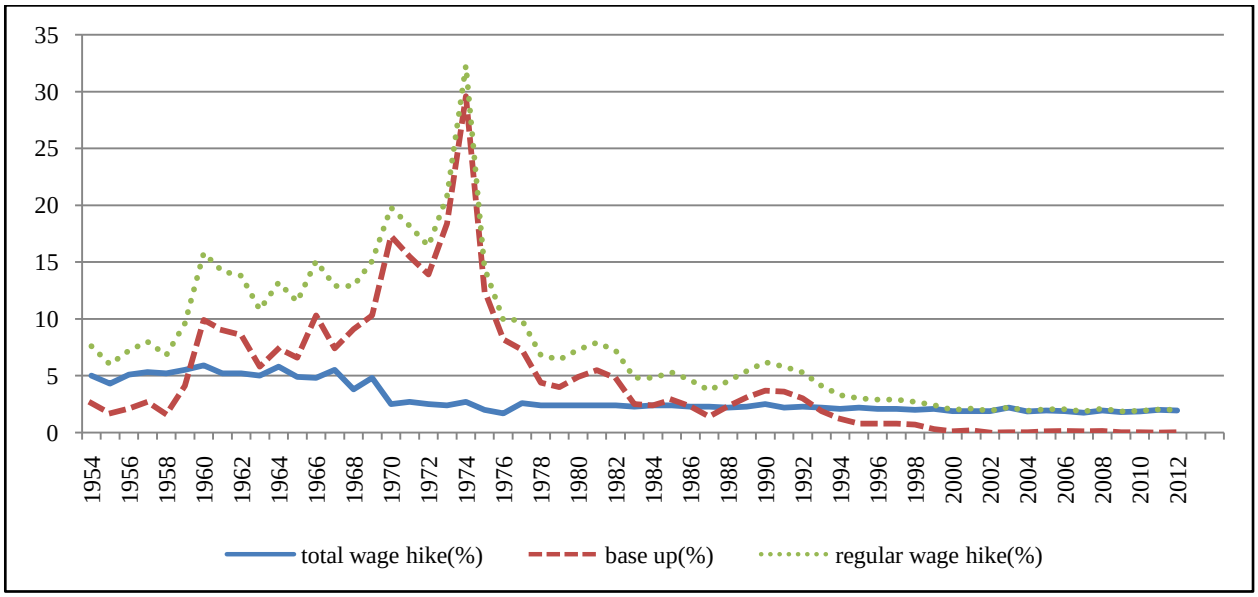

Figure 1. The chronicle of wage hike of Japanese companies, source: Nikkeiren and Nihon-Keidanren survey.

"Regular wage hike system" consists of two parts. One is "the hike by personnel appraisal". The better employees get the appraisal, the more pay can be given to them. Personnel appraisal is controlled by employers. In other words, whether wage hike should be done is initiated by the management side.

The other is "the automatic hike". It means that the more seniority (length of service or age), the higher wage hikes. This hike mainly covers living costs for workers, while the seniority is also reflection of skill level, degree of ability and loyalty to an organization. Sometimes these two parts are separately decided and sometimes they are mixed and borderless. The reason is that high appraisal and long length of service are often related each other. But even though roughly, two parts are separately considered, at least according to NIKKEIREN's statistics.

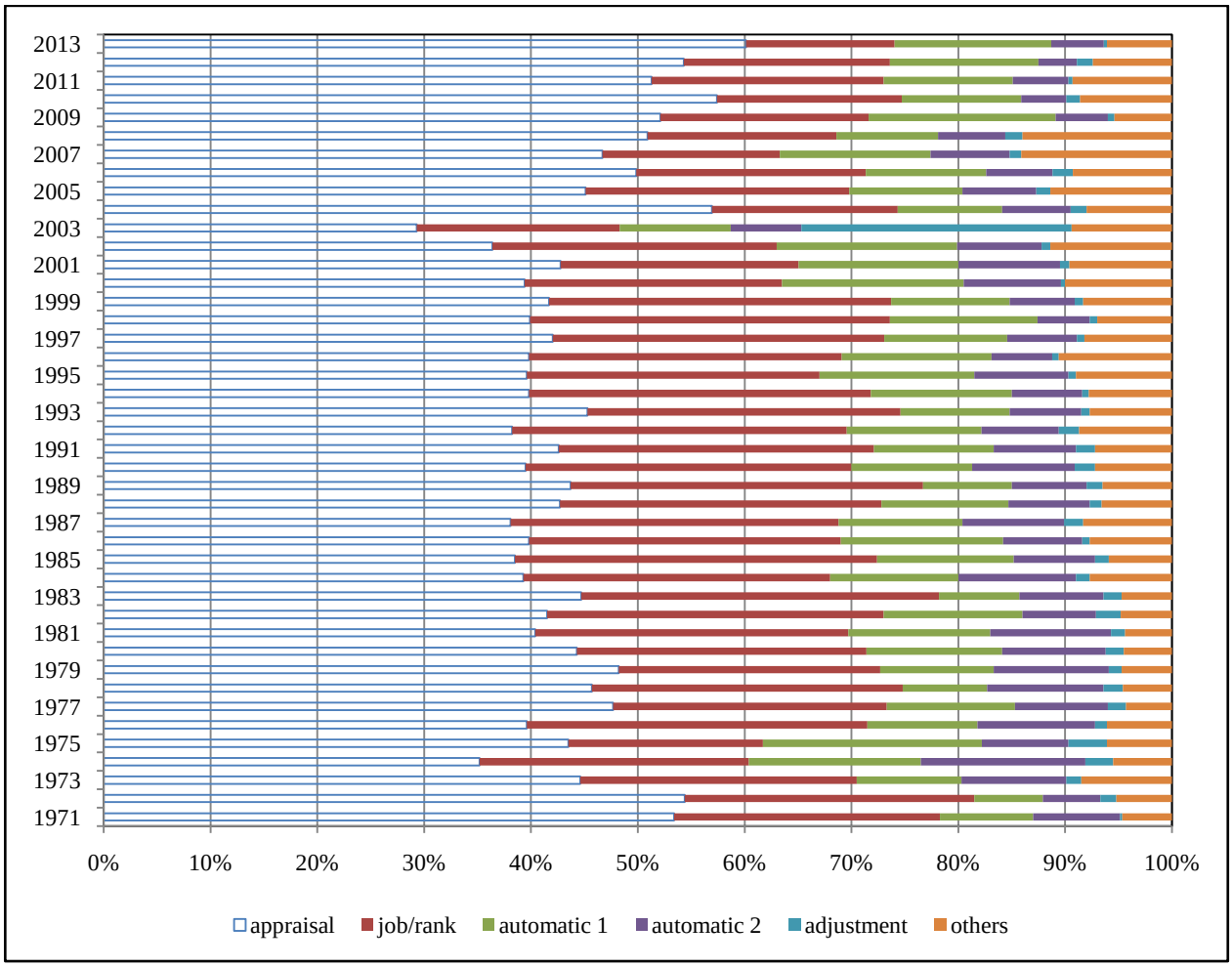

Figure 2. Share of factors in regular wage hike, source: Nikkeiren and Nihon-Keidanren survey.

Secondly, go back to the history for a while. Regular wage hike system was "officially" recognized as a main compensation policy by Japanese employers in 1954, when NIKKEIREN advocated the introduction of the system to Japanese companies. NIKKEIREN was established in 1949 by Japanese employers in order to fight against such radical labor movements and to realize industrial peace in Japan, in the name of "Employers, be righteous and strong".

From its establishment, NIKKEIREN tried to recapture the initiative of the company management from labor unions. Promoting regular wage hike system was one of the most indispensable factors to stabilize wage orders of employees in organizations. Comparing with base up, employers can control wage hike rate with regular wage hike system by themselves. So, recognition of regular wage hike system at the center of Japanese compensation system is an essential issue for Japanese employers.

Wage Determination in Japanese Companies During 1990s—From "Pay for Seniority" to "Pay for Performance"

"Pay for seniority" and "pay for ability" were actually popular wage determination policies in many Japanese companies until 1980s. However, the economic environment changed dramatically from 1990 worldwide.

In Europe, the Cold War ended and the communism block led by USSR was broken. In Asia, a lot of countries took off for higher economic development. As a result, the number of actors in worldwide market economy increased. These phenomena caused “mega competitions” among market actors.

In Japan, the bubble economy burst in 1990, causing the long-time stagnation and deflation for more than 20 years. The pace of economic growth slowed down and the valued added created by a company kept on shrinking for many years. Japanese employers had to change the idea to divide the pie between labor and management and among labors.

“Pay for performance” was introduced to a lot of Japanese companies at the time, which was generally based on “objective” appraisal to employees’ results and performance. This pay system seemed to deny “seniority”, including length of service, age, living costs, etc. Under pay for performance, the wage of each personnel may be declined theoretically, which is up to the result and performance of employees.

NIKKEIREN proposed pay for performance through 1990s, linking wage system to the new employment system, called “employment portfolio”. In “employment portfolio”, employees are divided into three kinds: regular workers, specialists, and atypical workers. Pay for performance should be applied to regular workers and specialists. NIKKEIREN aimed at more effective division of value added among employees, based on their contribution to companies. The concept of “employment portfolio” became popular in those days and it is still discussed sometimes by parties concerned.

The purpose of NIKKEIREN’s introducing pay for performance is not for inducing tough competitions among employees, but for developing “human-oriented” management that NIKKEIREN and Japanese employers have advocated for a long time. Under “human-oriented” management, employees should contribute to their companies, making full use of their abilities. It was thought to be a kind of “self-actualization” of employees by NIKKEIREN and Japanese employers. NIKKEIREN also thought that placing them to their suitable positions and paying to them based on their contribution to their companies is the best way to vitalize both companies and employees.

NIKKEIREN also invented the idea of “multi-path pay schemes”. Employers prepare some kinds of pay schemes, according to the employment styles such as shown in “employment portfolio”. As for regular workers, pay for performance should be applied; as for atypical workers like part time workers, dispatched workers, et al., hourly wage payment should be applied. In those days, one measure for payment was applied to all kinds of employees. What was new in those days was that NIKKEIREN divided employees into some types and suitable measures should be applied to such kinds of workers. This was advancement of compensation policies under the idea of “employment portfolio”. The idea was accepted to Japanese employers and their styles were transformed to each company through 2000s.

Pay for performance system became notorious in Japan, mainly because of employers’ lacking the measures to appraise personnel performance objectively. In other words, Japanese business style was not so suitable as to adapt pay for performance system, owing to their implicit and tacit ways of management. The word “pay for performances system” almost disappeared until the middle of 2000s as a “buzzword”.

However, the idea of pay for performance system became linked to the “regular wage hike system”. What pay for performance system left was more emphasis on the part of “pay by personnel appraisal” in “regular wage hike system”. In other words, the part of “pay by personnel appraisal” in “regular wage hike system” was strengthened by “pay for performance” through 1990s.

Also, it should be born in mind that shrinking of base up, nearly zero nowadays, was the opportunity of draw the attention to “regular wage hike system”, which guaranteed constant payment to employees, even though it was connected to personnel appraisal. NIKKEIREN made full use of regular wage hike system, in order to retain their initiative to control the wage level in their companies, even under the boom of “pay for performance system”.

Wage Determination in Japanese Companies During 2000s—Why “Regular Wage Hike System” Dies Hard?

During 2000s, Nihon-Keidanren (succeeding NIKKEIREN, by the merger of NIKKEIREN and KEIDANREN) started to introduce a kind of “pay for role” system to Japanese companies.

As mentioned before, the “role” defined by Ishida is market-oriented idea, which prefers performance to seniority and ability. But the “role” mentioned by Nihon-Keidanren is more comprehensive jargon. Job description in the “role” is not so strict as “job”. It reflects not only result and performance but also abilities and length of service. It is a kind of hybrid of pay for job, pay for performance, and pay for ability. Reconsidering the failure of “genuine” pay for performance, Japanese employers focused not only on visible performance but also on invisible process to create the results, employees’ abilities to make performance.

Different from Ishida’s market-oriented idea of “pay for roles”, Japanese employers still make much of “seniority” or “length of service”. Nihon-Keidanren refers to the importance of long-term employment. Nihon-Keidanren explains the point in the paper as below. “The compensation policies should make full use of advantage of long-term employment. Especially it is important to include human resource development and motivation factors in compensation policies, in order to activate long-term/regular workers” (2008).

Excerpt from Nihon-Keidanren’s report named “Establishment and Practice of Wage System Based on Job, Role and Contribution” (2008). It means that “pay for role” taken by Japanese employers is not mere market-oriented defined by Ishida but more comprehensive idea.

Figure 3 shows the important issue to be considered in compensation policies by Japanese employers. As for supervisors, ability, role, and performance are important. As for rank and files, ability, job, and role are emphasized. Especially, ability is most prioritized both for supervisors and rank and files. The share of “role” is not so large as expected.

In reality, the interpretation of “pay for role system” differs by company. Some put priority on ability of workers and the other emphasize their performance. Even length of service is not completely denied as a factor to be considered, because it was still regarded as the source of living costs, symbol of loyalty, etc.

	Total	Job	Ability	Role	Performance	Age/seniority
Supervisors	100	15.4	30.2	28.9	23.2	2.3
Rank and file	100	15.6	52.7	13.9	8.1	9.8

Figure 3. Important issue to be considered in compensation policies by Japanese employers (%), *Source.* Nihon Keidanren survey (2014)

Now back to “regular wage hike system”. As shown in Figure 1, “regular wage hike system” has died hard among Japanese companies for half century. Even in the era of pay for performance in 1990s and pay for role in 2000s, it keeps the presence steadily.

There are some reasons why it has survived.

Firstly and mainly, Japanese employers have clung to taking initiative to determine wage hike rate, in order to keep the order of in-house organizations. Base up is determined by collective bargaining between labor and management in Shunto (Annual Spring Wage Negotiations), while “regular wage hike system” can be determined by the initiative of management, based on their office regulations, labor contracts, and personnel appraisal, as far as it is not against laws. All in all, Japanese employers have consistently strengthened “the part of the hike by personnel appraisal” in regular wage hike system, by introducing some kinds of pay systems such as pay for job, pay for ability, pay for performance, and pay for role. Whatever compensations policies they take, “regular wage hike system” has never discarded by Japanese employers. The above compensation policies are kinds of “appearances”. Regular wage hike system has been at the very core of compensation policies in Japan for a long time.

Secondly, the part of automatic pay in “regular wage hike system” has played the role of safety net for employees, by guaranteeing living costs for them. Employers were not able to ignore the factors which stabilize employees’ standard of living, induce the loyalty of employees to them, and keep the talents in their organizations.

Conclusions

“Regular wage hike system” will continue to live, as long as Japanese employers want to retain their initiative to run their company management, especially from the view of personnel management. But nowadays, there are some factors to change the current situations.

Firstly, labor unions want “regular wage hike system” to be included in an agenda of their collective bargaining. Base up is almost zero recently (see Figure 1), owing to prolonged deflation. Labor unions are required to show their presence in wage negotiations to their member workers. They expect that participation in the process of “regular wage hike system” is regarded as one of their effective ways.

Secondly, “regular wage hike system” is applied to “full-time” regular workers, while “part-time” non-regular workers are not included in the system. The percentage of non-regular workers is nearly 40% in Japanese employed workers in recent statistics. Whether this “unfairness” can be allowed in the near future will be a problem, in the view of “Equal Work, Equal Pay Principle”. The government started to discuss this issue recently. Some kinds of “comprehension” may be necessary.

“Regular wage hike system” will survive as a compensation control way in Japanese companies also in the future, while employers may want to narrow the hike rate, even zero, by strengthening personnel appraisal under the current tough economic conditions. However, some modifications, considering the change of Japanese society, might be necessary from the view of equal treatment among employees.

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Journal of US-China Public Administration, Mar.-Apr. 2020, Vol. 17, No. 2, 63-70
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Managing a Teaching Technologies Assimilation Program at Nursing School in Israel

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The nursing field is constantly evolving and therefore nurse educators are constantly asked to be updated with relevant knowledge. The nurse educator's role in Israel is to teach and develop the nursing profession in the future generation. This role brings many and varied challenges, one of which is the inter-generational gap. It is not a simple challenge to be interesting, innovative, and creative for the future generation. The nurse educators in Israel who train and educate the nursing future generation hold a master's degree and graduate advanced courses in selected clinical areas and they move from the clinical field to teaching in order to influence and shape the future generation. This role holds great responsibility for Israeli nurses and it requires professionalism. There are 23 nursing training institutions in Israel. Some operate in nursing schools and some in academic institutions at universities and colleges. The students are adultsat 18 years and older; they study in several study courses so the nurse educators must know how to adapt teaching to all study courses.The intergenerational gap and technological advancement are some of the influencing factors on teaching interesting, motivating, and inspiring lessons. In one of the academic nursing schools in Israel, nurse educators had adesignated training program in which they learned how to integrate technology in teaching to make the lessons more interesting and thus to bridge the intergenerational gap. The article's goal: To describe an intra-organizational training procedure for nurse educators' staff in academic nursing school in the center of Israel, from learning to implementing selected technologies in class to innovate and stimulate interest and motivation among the nursing students.

*Keywords:*nurse educator, inter-generational gap, technologies in teaching, X,Y,Z generation, action research

Introduction/Literature Review

There are 23 nursing training institutions in Israel. This profession went through academization process in the 1990's and is taught in colleges and universities (Nursing Administration, August 13, 2019).

Nurse educators in Israel are registered nurses holding a master's degree and up who came to the training centers including nursing schools from the clinical field to teaching and influence the shaping and leading of the future generation. These nurse educators face many challenges. Some of those challenges are teaching and making lesson plans. Teaching process is nor simple. The leading teaching methods in nursing schools are lecture, simulations, PBL etc.

The students in the nursing training centers are adults who study various study programs as: a 2.5 years first degree military academic course, a four years first degree academic course, and a 2.5 years academic retraining course and a generic certificate course program in a unique program of 2.5 years (Work Plans

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Nursing Administration 2017, Ministry of Health to Healthier Life, August 20, 2019).

The students are in age's range of 18 to 60+ and are in different generations:

The X generation: a generation born in the 1960's and 1970's, characterized as a settled generation willing to invest in his work; a generation that is loyal to the company.

The Y generation: a generation born in the 1980's until mid-1990. It have been said that this generation thinks only about himself, not loyal to the company or the organization in which he works (Csobanka, 2016; Almog & Almog, 2013).

The Z generation: young people who born in the beginning of the 2000's (study in the military academic reservation framework); the millennium generation; a technologic generation who excel in using and applying variety of technologic means like the internet, social networks, and cellular communication. Using their technologic knowledge, they create personal, social, and professional relations in the real world. This generation has quick understanding and as soon as they get the idea, they quickly get bored, impatient and move on (Avman & Levi-Zeira, 2014).

Since each and every generation has different characteristics and perceptions, it may cause high variability, resulting in conflicts, misunderstandings, and disinterest. The younger and contemporary generation see the older generation as dinosaurs and old-fashioned unconnected to the new and advanced world (Geffen, 2018). This gap is reflected in every home between parents and children and of course in the nursing training system.

Today, in most higher education institutions, frontal teaching is predominant. The method's advantages: enables structured knowledge transfer, saves time and financial resources; allows organizing the information and presents it in a logical order from light to hard, basing previous knowledge bodies (Mahalav, 2003).

Harpaz (2000) claims that teaching is a communicative, structured, and continuous set of educator activities designed to stimulate or create learning experiences to the student.

Technological development and its entry to education affect us and our daily conduct. Many teachers claim that lecturers must face this challenge. Today's students grew in a technological era (Hativa, 2016). The technological diversity existing today for educational activities is diverse in many areas: writing, communication, visualization, learning games (Ministry of Education, September 13, 2018). It was found that using technologies stimulates interest and motivates the student in class. Therefore, the nurse educators and the students must know and assimilate these technological tools in class (Arkorful & Abaidoo, 2015).

The Research

Type

Action research qualitative research. This research is usually performed by educators and practitioners. In this type of research, the researcher examines the field he works in and tries to build space new meanings and enable change processes. The researcher tries to understand the problem source and define it by a research that its result is a grounded theory. The research insights lead the researcher to change the system and examine the change's benefit (Creswell, 2014).

Problem

There is an inter-generational gap in the nursing training frameworks in Israel. Most of nurse educators who train the future generation are part of the X generation and some are of the Y generation. However, the training frameworks students are the X, Y, and Z generations. Since the nurse educators have to be constantly

updated in the relevant professional knowledge, they must also learn and know updated teaching methods and different technologies that support teaching.

Goal

Managing an intra-organizational training procedure for nurse educators' staff in nursing school, where the staff will learn, implement, and integrate technological tools in lectures and classes.

Target Audience

Eighteen nurse educators from academic nursing school in Israel.

The Characteristics of the Nurse Educators' Staff

The characteristics of the nurse educators' staff are listed in Tables 1-3.

Table 1

Describe the Participate Age

Age groups	Num of colleges	Percent	Generation
39-35	4	22%	Y
45-40	6	33%	X
50-46	4	22%	X
55-51	0	-	X
60-56	3	17%	X
Over 60	1	6%	X

Table 2

Describe the Participate Gender

Men	1
Women	17

Table 3

Describe the Participate Education

MA	12
PhD	6

Objectives

1. Professional intra-organizational training by a leading team.
2. Exposing the staff to variety of advanced teaching/learning technologies.
3. Planning the assimilation stages with content experts in the training staff by: needs assessment, planning, and implementation.

Advantages

The advantages are listed in Table 4.

Disadvantages

1. Depending on computer and internet.
2. Requiring infrastructures supporting the technologies.
3. Excessive use of technologies leads to missing the learning goals.
4. The lecturer does not know to solve technological malfunctions if occur.

5. Waste of time in class (to connect/receive).
6. Students' loss of interest/boredom.
7. Focusing on technology instead of content (focus on the method).

Table 4

Describe the Advantages

For the staff	For the students
The staff know how to use updated variety of technologies	Active and interested students
More interesting and curious lectures	Remembering the subject
Active students	Bringing the lecturers generation and the students generation closer (intergenerational gap)
Saving time during lecture	

The Method

There is a graduated intervention process by the Kirkpatrick and Kirkpatrick (2016) guiding programs' planning model.

Figure 1. The four stages of training process. Kirkpatrick and Kirkpatrick (2016).

The Implementation Stages

1. Assessment of training needs.

An initial meeting with teaching technologies content expert and a nuclear group of six nurse educators.

This meeting included:

- Describing the current school learning plan in the generic study courses including academic and academic retraining.
- Planning and spreading core plans on the board.
- Raising possible difficulties in the learning process as: problems in time, desire to assess students' knowledge during learning, performing surveys, students who do not repeat the previous lesson study material, students who do not remembermaterial based on a previous course like anatomy and physiology and a repeat is required.

The meeting's outcomes were written on the board as a scheme describing the outcomes beside the technologies which match the needs. Five relevant technology types, which meet the staff's needs, were formed by the end of the meeting.

2. The learning stage.

Goal: to teach the nurse educators staff the selected technologies meeting the staff's needs.

The team was divided to two work groups with the computer in the school's computer room. Each team

member set in front of a computer with a matching guiding book in which the content expert (instructor) presented general information regarding the technological tool and then there was an exercise.

The learned tools are Mentimeter, Collaborative Board (Padlet), advanced search on YouTube and Google, creating collaborative files on Google Doc.

In this stage, there was an open discussion of the team and the instructor:

- Smartphones were used in the workshop. Each participant sent an activity to another participant in the group as questions and surveys were performed.
- The team asked questions about: (a) Technique "and if it will fail in class?" "How long will be spenttoenter the software?" (b) Questions regarding the technology essence as: where and how to save the survey. The idea of a "cloud" which replaces the USB drive was not always understood.
- After introducing each tool there was a discussion regarding the activity and lessons; the tool may be used in order to understand and know each tool's potential.

Problems that were found during the process: Some Google software were blocked due to information security in the computers of the hospital in which the nursing school operates. Therefore, there was no option to implement all the studied tools and some of the tools were only presented in terms of: nature, advantages, and disadvantages and the staff could not operate and feel the tool.

The participants' responses: Some of the participants began to try and "play" with the technologies. Some succeeded and had strong desire to continue trying it in class. Some theoretically planned what technology will match the teaching content. There was some independent work and enthusiasm.

3. The implementation stage.

By the end of learning days, each nurse educator had to try and assimilate two tools of her choice out of learned tools. The selected tools must be implemented in class.

As part of the assimilation process the instructor is available to the nurse educators by the phone or e-mail for comments and difficulties. Before starting this stage, each nurse educator will fill out a structured form that will list and detail the reason for choosing the digital tool, and what she wants to achieve using this tool in techno-pedagogical term and will personally reflect the process after implementing the tool.

This stage was about eight months long—each participant in his own pace.

4. The evaluation stage.

The teaching staff meeting with the content expert was divided in two:

Part 1—the instructor invited the participants to share and answer the following questions:

(1) Which tool did you use?

(2) How was the experience?

(3) What were the barriers/difficulties?

(4) What would you do different?

The team freely answered the questions. Most of the used tools were: Mentimeter, Collaborative Board, inserting videos in presentations.

The experiences shared were:

(Participant No. 9) "I began with the Mentimeter in the drug therapy management course as a summary of the course and knowledge examination. At the beginning, I had a hard time and trouble with the computer. I arrived to class and couldn't remember the password and it was embarrassing ... but the second time I did that. I came ready with the password and operated the questions to the students and explained them it their

opportunity to see their knowledge status. At first only few students participated, but then more and more students joined. The discussion after each question I gave was fruitful..."

(Participant No. 9) "An additional tool I used two month ago is a video from the Grey's Anatomy dealing with conscious choice and free choice ... I sent the students the link to the video and the next day in class we held a discussion. I did kind of reverse class ... not all the students saw the video but it didn't bother me and I held the discussion I wanted ..."

(Participant No. 5) "I used Mentimeter in a 100 students class… it was not simple… it was also the first time I used this tool and I had to explain the students how to use the application in their smartphones. Some got it quickly and some needed help. At the beginning it took time… there were also bugs and some of the smartphones did not show all the options… I have got over it by telling some of the students to work with others".

(Participant No. 5) "The second time I used Mentimeter was in another class as a summary of previous lesson…the students were enthusiastic and wanted more... it is a matter of culture ... the more time you use in technology, this "language" is familiar to both the lecturers and students.

(Participant No. 4) "I teach breath with Meira and we prepared rehearsal questions in some of the subjects to show the knowledge level... we also inserted videos to the presentations for illustration...the very fact it was required and we had to prepare it. It opened us up to learn the tools and know it..."

(Participant No. 6) "I thought I am a technological person but I found out that I am not so much ... It took me a while to prepare all the materials. I did not do it yet in class and I wonder what will happen, but as I hear here there might be bugs even though I tested the tool earlier and may forget until I operate the tool in class... I made an instructions presentation for myself".

(Participant No. 14) "I am a non-technological person. I connect with a phrase that came up here for the first time in front of a norm... If it is not embedded in the organizational norm, I will not do it if it is not required... I do not feel I miss it, but since I had homework, I found some tools that can help me, like applications and videos in clinical content, but there is a problem that my computer does not support Google. Form so, it was very easy for me to give up. I also had a difficulty in working alone. I am a person who needs close guidance and direction. I am a person who must be in control…I cannot stand in class and ask for help. I also do not know which tool might suit me to which subject. For me, using a presentation is enough".

(Participant No. 14) "I used the Collaborative Board with the 1st year students asking about the nursing professional reserve… it was very nice and interesting to hear them. It helped the students to open up since it was anonymous and was thrilled I succeeded".

(Participant No. 11) "I also have difficulties with technology and want a tight guidance… I do not know what my barrier is, lack of knowledge or lack of experience… it makes me insecure".

(Participant No. 16) "I used Mentimeter in ethics class and I presented an event to the students and they had to grade the event by its moral level by scoring. Then I divided the students to groups and they had to grade the event as a group. They saw the gaps in their individual grading, since each one of them graded by his moral and the values he grew up with, but as part of a group the values are influenced… it was a really good experience… in this exercise we cleared the terms values, norms and agreement. I am favor of technology and will continue with it".

(Participant No. 7) "I do not use Mentimeter due to the slides limitation. It confuses the students, so I have decided to put the exercises as part of a PPT presentation and animate… there is a discussion in class".

(Participant No. 7) "I use the Collaborative Board as part of the critical reading classes… this tool enables

sharing and therefore stimulates thinking… I also use videos in each lesson but the problem is that not in each class the video works and it is annoying…"

(Participant No. 12) "I am a very technological person but not techno-pedagogic. I use Cahoot for few years to review the subject and it is like a game at the end of the course and it is very nice. I did not think to use Collaborative Board in class because I do not understand the meaning…after all, I am in class listening to the students. I thought using it when the students are at home before learning in class…soon I will have rehearsals I may use it".

Part 2—dealt with how to proceed: How do you think we should proceed?

(Participant No. 4) "Most of us used the Mentimeter, so we should buy the software and give everybody a chance to experience it and repeat the summarizing feedback".

(Participant No. 9) "I would like to practice more tools…I would like to have escorting and guidance, maybe in a smaller and relevant team".

(Participant No. 11) "I have technologic need for the student and pedagogic knowledge for me and I have to match the right tool to the class… I want tight escort… the courses I teach are in thinking development and not so clinical subjects… I need help in this…"

(Participant No. 13) "I want to study tools that will develop the student's individual learning…"

(Participant No. 14) "If we will continue and take it forward we will lose it and it is a shame... I have to be leaded in this change since I do not need the change unless it is an organizational requirement…"

(Participant No. 16) "I agree to continue only if as a lecturer I will see it has a value to continue learning otherwise it will be lost…"

(Participant No. 6) "I remember that my colleague came out thrilled from class after she managed operating the tool in class and it inspired and empowered me…"

Summarizing

The fillings the staff shared follow their experience showed motivation, seriousness, and a desire to learn and experience.

- The workshop raised the awareness and experience using a small part of technologic tools in teaching.
- The implementation stage of the process led to change in the staff's behavior. The process caused the staff to go out of its comfort zone and experience threatening technologies.
- The process requires suitable organizational preparation as improved computer infrastructure.
- There was a suggestion to buy the technologic tools as a school's permanent resource and not settle with a small and limited free software.
- It came out in the meeting that good experience creates a desire to continue experiencing a tool, while a lesser experience causes deterrence and leaving, therefore, a closer escort is required for some of the staff.
- The staff has a strong desire to keep and develop the intervention results in the organization.

Conclusions

To promote relevant subjects in the staff training, it is important that the management level will be attentive to the employees' level since they should act and implement the changes and progress.

Collaboration at all the organization's levels brings uniformity and even reinforces the collective need for organizational change.

Future Recommendations

1. Beyond learning the new subjects, there is a need to make sure there is an appropriate organizational infrastructure which supports and allows the change, i.e., a stable computerized system that supports the digital tools and allows its application in all classes.

2. To promote and preserve the change in the organization, there is a need to speak the professional language in daily conversation and sometimes even give the organization's personnel a professional escort that will help them in new problems raised or even support staff members who had a previous unsuccessful experience or were afraid to experience.

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Journal of US-China Public Administration, Mar.-Apr. 2020, Vol. 17, No. 2, 71-85
doi: 10.17265/1548-6591/2020.02.004

Global Value Chains and Their Challenge to the Sustainability of Exhaustible Resources in the Pacific Alliance

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In this paper, we identify which global value chain (GVC) made intensive use of minerals between 2005 and 2015. Input-output analysis instruments, complemented with network theory algorithms, are used for this purpose. We also describe, under the weak and strong sustainability approach, the mechanisms of resource rent capture and distribution used in the Pacific Alliance countries, as well as the creation of environmental laws, which governments have been forced to implement given the extractive boom of the 1990s and the first decade of this century.

Keywords: mining, global value chain (GVC), resource rent, environment and development

Introduction

The super-cycle of commodity prices in the first decade of the 2000s certainly favored the exports of mining and oil resource-rich countries. Among these countries are Chile, Colombia, Mexico, and Peru, who comprised the Pacific Alliance since 2011. These economies share the fact of having adopted a free trade policy that facilitates direct/indirect connection between international prices and extractive activities fluctuations. Thus, price boom and its corresponding boost on extractive activities, have two possible effects on these supplier economies: On the one hand, it poses challenges to the local regulatory capacity to guarantee future resources and environmental sustainability; and on the other hand, it allows reaching levels of economic growth at present that may have positive effects on the country's per capita income.

In order to distinguish which global industries have been the driving forces of extractive activities, the input-output tables published by the OECD (2018) with data from 36 economic industries for 64 countries, between 2005 and 2015, are used in this paper. Input-output analysis tools, complemented with centrality indices of the network theory (Borgatti & Everett, 2006), are used to identify which global value chain (GVC) makes intensive use of minerals. Although the concept of GVC has been created to understand the production process of goods, from design, inputs addition, until its transformation into a final good, this paper focuses on identifying the role that the Pacific Alliance countries play in the first links of the value chain, as their participation in the world production process is more representative at this point.

Likewise, in the context of the weak and strong sustainability approach (Dietz & Neumayer, 2007), we describe the construction of government regulatory tools, particularly, the mining royalty's collection and distribution scheme, the obligatory nature of environmental impact studies, and the incorporation of prior consultation in the Pacific Alliance countries.

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This paper is structured as follows: Introduction is followed by theoretical approaches about sustainable development and GVCs; description of the data and methods used; identification of the GVCs that make intensive use of minerals; identification of the instruments to capture and distribute resource rents developed in the countries evaluated; and finally, conclusions.

Sustainability in Natural Resources and GVCs

In terms of sustainability, the economic theory has developed a group of concepts that can be divided into two main branches: natural resources economics and environmental economics (Tietenberg & Lewis, 2018). This division started with the controversy regarding the extent to which it will be possible for science and technology to replace the natural ecosystem, or a part of it, on which economic activity is based (Daly, 1997; Dietz & Neumayer, 2007). Thus, weak sustainability is the approach that assumes economic growth will be sustainable over time if renewable resources are exploited according to their own reproduction rate; and, exhaustible natural resources are replaced little by little by man-made capital, to such a degree that the total capital stock of a society, natural and non-natural capital, remains constant, guaranteeing the sustainable continuity of production activities. This is the assumption on which most of the economic theory of natural resources are based, whose origins are found in the contributions of Hotelling (1931), Gordon (1954), Solow (1974), and Hartwick (1977), among others.

Otherwise, the strong sustainability approach assumes that there are nature's vital services, such as waste absorption, climate regulation, or the support of various forms of life, which are irreplaceable by some form of man-made capital. Thus, in order to extend the potential growth, it is critical to guarantee its maintenance. This is the starting point of the economic-environmental theory, based on the contributions of Georgescu-Roegen (1971), Pearce and Turner (1995), Daly and Farley (2004) among many others.

Although both approaches are still under development, resource management policies and environmental regulations currently applied are justified for both approaches; however, the weak sustainability approach has been "easier" to use thanks to the formal approach provided by the so-called Hartwick rule (1977). According to this rule, a society's constant and indefinite per capita consumption can be achieved if all resource rent coming from the extraction of a non-renewable resource is captured and transformed into different forms of manufactured capital. The concept has been further developed by the World Bank (The World Bank, 2011) including investment in education (added to the manufactured capital) and environmental degradation (which reduces natural capital), thus calculating the genuine savings that would be the balance between the assets that a country gains and loses annually, and which should be at least constant in time to maintain wealth. According to this approach, a country's wealth is estimated by the sum of all natural and non-natural assets it has at a given time, and which serves to generate a continuous income streams with which the satisfaction of population needs is guaranteed in an intergenerational way.

In the process of substituting natural capital for manufactured capital, there are three moments to highlight: estimation of resource rents; development of legal mechanisms for its capture by the government; and the evaluation of its transformation into manufactured capital through public spending. In this regard, some advances are discussed.

The World Bank defines the natural resource rent as the difference between the market price and the unit extraction cost, which includes the normal rate of return on capital. Each country's genuine savings and the wealth in form of assets have been estimated since 2006 using this concept. In its latest version (Lange, Wodon

& Carey, 2018), they find, for example, in 2014 natural capital reached 47% of the total wealth in low-income countries. However, in many of these states, especially in the sub-Saharan African countries, per capita wealth fell due to difficulties in transforming natural capital into manufactured capital.

Regarding the resource rent capture, it is found that the commodity consumption boom of the early 2000s has driven changes in tax legislation in several Latin American economies. These changes are evaluated by various institutions (FMI, 2012) and authors such as, Brosioand Jimenez (2012), Gómez, Jiménez, and Morán (2015), Viale (2015), among others, and in the following sections of this paper more precise references to these works will be made.

Regarding the use of resource rent captured to create manufactured capital, main publications evaluate the effectiveness of public spending on infrastructure from a tax efficiency perspective rather than under a framework for sustainability analysis. However, some works using the natural resource approach are those of Zarskyand Stanley (2013), who measure the impact of the Marlin mine (Guatemala) in the creation of productive infrastructure and local employment, under a weak sustainability approach; and also evaluate the risk arising from compliance with the environmental impact studies intended to maintain the ecosystem vital functions, under the strong sustainability approach. In both cases, unfavorable results have been found. From another point of view, Fuss, Chen, Jakob, Marxen, Rao, and Edenhofer (2016) estimate the infrastructure gap in water and sanitation, power, roads, and telecommunications over the world, and compare it with the resource rent published by the World Bank. They find, for example, that 10% of the resource rent could theoretically close the gap in access to water in almost all countries. However, resource-rich countries have weak institutional frameworks that prevent the government from capturing a greater percentage of resource rent. Likewise, under the weak sustainability approach, Landa (2017) finds that the increase of mining rent that subnational governments of Peru received, which by law must be invested only in infrastructure, is higher than the public expense of this item in education, health, and road network, due to institutional hurdles the country faces in its early process of regionalization.

Thus, at this point, we note that the need to transform resource rents into manufactured capital is not yet an idea anchored in the economic theory, nor is it a general guide to evaluate the public policies managing natural resources.

On the other hand, while these sustainability approaches have been built, the world economy and trade have undergone significant changes since the second half of the 20th century. The continuous process of intra- and inter-sectoral division of labor and its corresponding industrial linkages in developed economies have reached a new stage, moving up to the international level, thus achieving the diversification of production processes with greater speed, scale, depth, and extension (Elms & Low, 2013). One of the approaches used in the study of this new form of production is the GVC approach. A GVC is defined as a set of economic units that perform the activities necessary to create a product or service, from its conception to end-user sale. According to Gereffi and Lee (2016), the GVC approach is built to understand how value added is created and captured within various types of industries and focuses its evaluation on two features of modern industrial organization: governance and scaling. Governance studies how the leading company organizes its supply chain on a global scale, while scaling identifies the strategies used by companies or countries to improve their positions in higher value-adding activities (Gereffi & Lee, 2016).

Based on this approach, Baldwin and Lopez-Gonzales (2013) develop measures of trade in value-added to identify how their formation has changed through the links in the chain. These authors, on one side, and

Timmer, Erumban, Los, Stehrer, and Vries (2014) on the other, note that the developed economies (G7 countries) have become service providers mainly, moving manufacturing links to other countries (China, Mexico, and Poland, for example), thus promoting their industrialization. Likewise, Blyde (2014) affirms there is a possible fast industrialization in the case of those countries that facilitate the linkages of national industries in a GVC.

In this paper we identify the specific industries that have led the jump to transnational production in the GVCs and show how, through the global trade network, they have promoted the extraction of non-renewable natural resources in different supplier countries, thus posing challenges to the local regulatory capacity, in a context where the mechanisms to guarantee its sustainability are not yet established.

Data and Methods

Input-Output Analysis Tools

Data processed in this evaluation come from the international input-output tables for the years 2005 and 2015, published by the OECD (2018), which contain transactions among 36 economic industries in 64 countries. In this version, the OECD divides the extractive mining industry into energy mining, which corresponds to the extraction of hydrocarbons, and non-energy mining, which deals with the extraction of metal ores and quarry material.

We use the table of intermediate demand to calculate the Leontief's coefficients (Rasmussen, 1956) of goods with high concentration of minerals and oil, and measure the degree of linkages formed throughout the production process. The calculation of the Leontief's coefficients for an industry *j* is performed by Equation (1), where *I* is the identity matrix and *A* the technical coefficient matrix (input weight *i* in the gross value of production in industry *j*). The sum of the resulting coefficients measures the drag capacity of industry *j* towards the rest of the economy. In addition, results of these calculations are accompanied by centrality indexes of the network theory (which will be explained below) as they yield more real figures.

$$B_j = \sum_{i=1}^{n} [(I - A)^{-1}]_{i,j} \quad (1)$$

Network Analysis Tools

Just as the input-output tables are composed of a group of industries and their monetary links, in social network theory, a network is formed by a set of nodes and their respective ties. Although the technical coefficient and the Leontief coefficient measure the direct and indirect effects of one industry growth over the rest, due to their calculation, this method assumes that infinite numbers of successive impacts could happen in a country, which is not real. Therefore, the Leontief multiplier measures the potential effect, but not the real effect of an industry's final demand growth (Schuschny, 2005). In contrast, degree and closeness index offered by the network theory serve to determine more accurately the scope of one industry growth over the rest.

The degree concept counts the number of direct links that a node p_k has with the rest of the nodes p_i forming a network of size *n*, calculated according to Equation (2). Thus, the larger an industry degree is, the better can transfer its growth to those who are directly connected to it, while the impact fades as indirect links are reached. The links represented by "*a*" can be the purchases made by an industry p_k to p_i (in degree) or its sales (out degree), in commercial values as in our case; or, in its binary form, $a = 1$ when it does exist or $a = 0$

when it does not exist (Borgatti & Everett, 2006). A standardized measure of the degree (indicator used in this investigation) is obtained by dividing the links of each node by the total number of possible links in a network (*n-1*).

$$C_D(p_k) = \frac{\sum_{i=1}^{n} a(p_i, p_k)}{n-1} \quad (2)$$

The closeness concept measures the number of jumps "*d*" that a node p_k needs to reach all network nodes p_i, according to Equation (3). In our context, it would show how fast (fewer number of jumps) or slow (greater number of jumps) would be the impact of an industry growth over its related sectors. This connection can occur through their purchases (In Closeness) or sales (Out Closeness) and it is normalized by dividing the jumps by the maximum number of direct links in a network (Freeman, 1979). Considering that in a more connected network there are fewer number of jumps, an inverse-count is used. Therefore, the higher the index is, the closer the nodes are.

$$C_C(p_k) = \left[\frac{\sum_{i=1}^{n} d(p_i, p_k)}{n-1}\right]^{-1} = \frac{n-1}{\sum_{i=1}^{n} d(p_i, p_k)} \quad (3)$$

In this paper, the Ucinet software was used to calculate these indexes, and then the Gephi software was used to make visible the strongest connections in the mineral and hydrocarbon trade network.

GVCs With Intensive Use of Minerals and Oil

In order to get an overview of the production segments in which mining resources participate worldwide, technical coefficients were calculated, classifying the data by industries. In the case of hydrocarbons, Figure 1 shows, on the one hand, a short chain that begins with extraction, goes through refining, and ends in the transportation industry. However, on the other hand, a more extensive chain is formed. This chain goes through refining, then chemical products manufacturing, plastics industry and ends up in vehicles manufacturing. In the case of the extraction of metal ores and quarry materials, the visible chain is formed by extraction; basic metals, manufacturing of metal products, machinery and equipment, and finally vehicles manufacturing. This figure also shows the main role of the construction industry which engages a wide variety of industrial goods; and the vehicles manufacturing industry, considered as the farthest sector of the entire chain that begins with extraction and receives a variety of processed inputs.

When we are evaluating the intermediate demand growth (purchase of inputs) of each sector, according to the horizontal axis in Figure 2, the agricultural industry stands out with 136%, but then followed by mineral extraction, mining services, and the manufacture of basic metals with figures above 100%. The Leontief's coefficient is calculated to identify where the impulse of such growth comes from. Figure 2 vertical axis shows that the manufacture of basic metals, vehicles, and electrical equipment are the industries that have shown the greatest theoretical drag capacity in the evaluated time.

Having identified that the fastest growing industries in the world economy are also linked to the value chain of minerals and oil, we will be seen below to which countries these sectors correspond. Based on the 50 countries-industries with the highest in degree, Figure 3 shows the respective value for the years 2005 (horizontal axis) and 2015 (vertical axis).

The industries belonging to China, the US, Japan, India, and Germany stand out as well as those that thanks to their purchasing capacity have produced the greatest movement in intermediate demand. In the same figure, the vertical distance with respect to the diagonal displays the magnitude of the in degree growth in the

two years evaluated. Chinese sectors stand out almost exclusively, which shows that during this century China continues positioning in the segments of world production with high consumption of minerals and hydrocarbons.

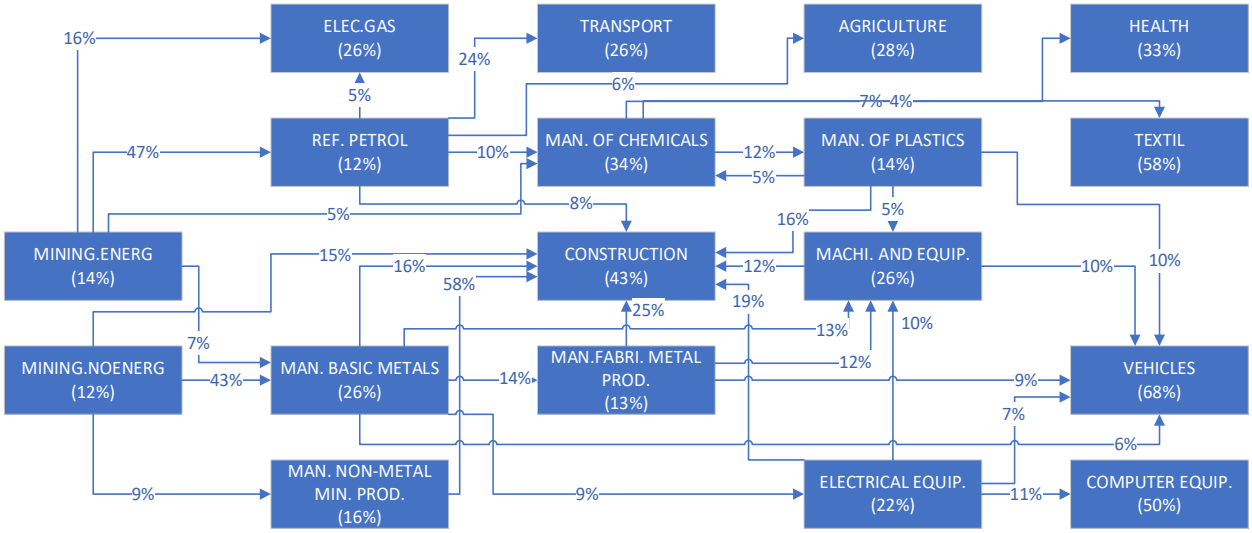


Figure 1. Segments of international production with intensive use of minerals and oil, year 2015. Note: Figures show the percentage of input sales from the industry in box to the linked industry. Sales between the same industries are shown in parentheses. Source: Inter-Country Input-Output Tables, 2018. Own elaboration.

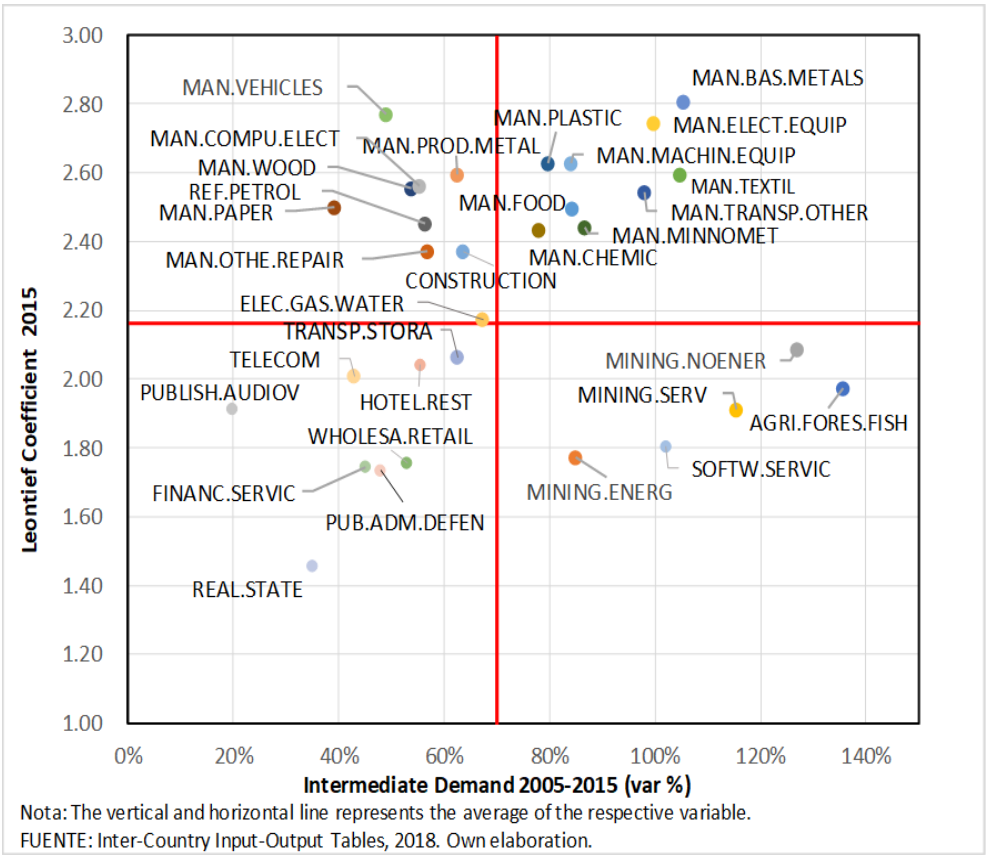
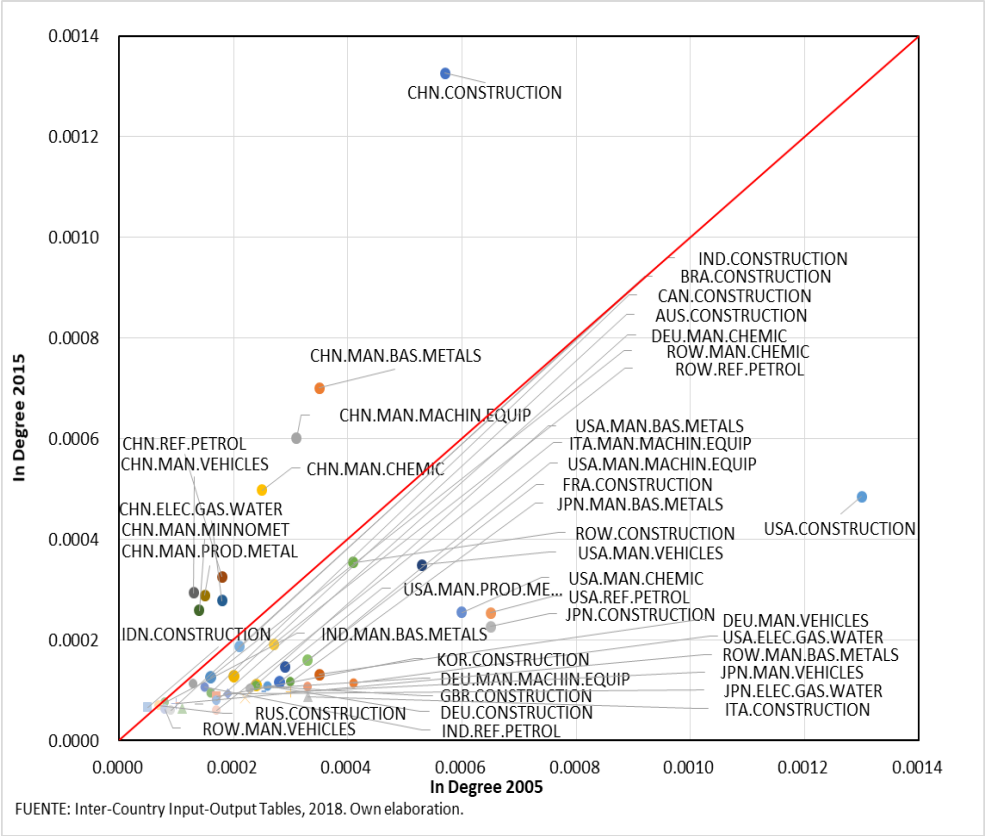


Figure 2. Intermediate demand (var %) 2005-2015 and Leontief coefficient by industries, year 2015.



FUENTE: Inter-Country Input-Output Tables, 2018. Own elaboration.

Figure 3. Input degree of industries with high mineral consumption, years 2005 and 2015.

The growth of production in the aforementioned countries-industries has been possible thanks to the increase of minerals and oil world supply in the years evaluated, and the participation of the Pacific Alliance countries becomes, hence, visible. Although these countries are not among the main global suppliers of minerals and hydrocarbons, their position does not stop to be important as oil exporters, in the case of Mexico and Colombia, or as exporters of metal minerals, in the case of Chile and Peru.

Thanks to the implementation of policies to open up to world trade and foreign investment since the 1990's, the corresponding extractive sectors have strengthened their participation in the first links of the evaluated world production segments, except for the Mexican oil sector, which has been suffering from a production crisis as a result of the depletion of its most important deposit. Consequently, hydrocarbons supply increased in monetary value between 2005 and 2015 by 169% in Peru, 115% in Colombia, 57% in Chile and dropped to 42% in Mexico. And, regarding the supply of metal minerals, the growth has reached 107% in Peru, followed by 71% in Colombia, 70% in Mexico, and 50% in Chile.

Gephi software has been used to make the forward linkages that start from the extractive sector of the Pacific Alliance visible. Through nodes and links, it shows the sales that leave from one country-industry to another. Results appear in Figure 4, and present Colombia, Mexico, and Peru's oil extraction connecting with Spain, the US, and China's oil refining, and then, each of these industries is responsible for supplying their own industries network. On the other hand, the extraction of metal ores from Chile, Mexico, and Peru is linked to the manufacture of China, the US, India, Japan, Canada, and Korea's basic metals, a sector that plays a key role in each one of the economies, since it supplies several industries radially, those that go until the manufacture of

automobiles, including also that industry in Germany. Finally, the size of the node representing China's basic metals manufacturing stands out, as it is proportional to its sales, and reflects the relative growth of this industry with respect to all others.

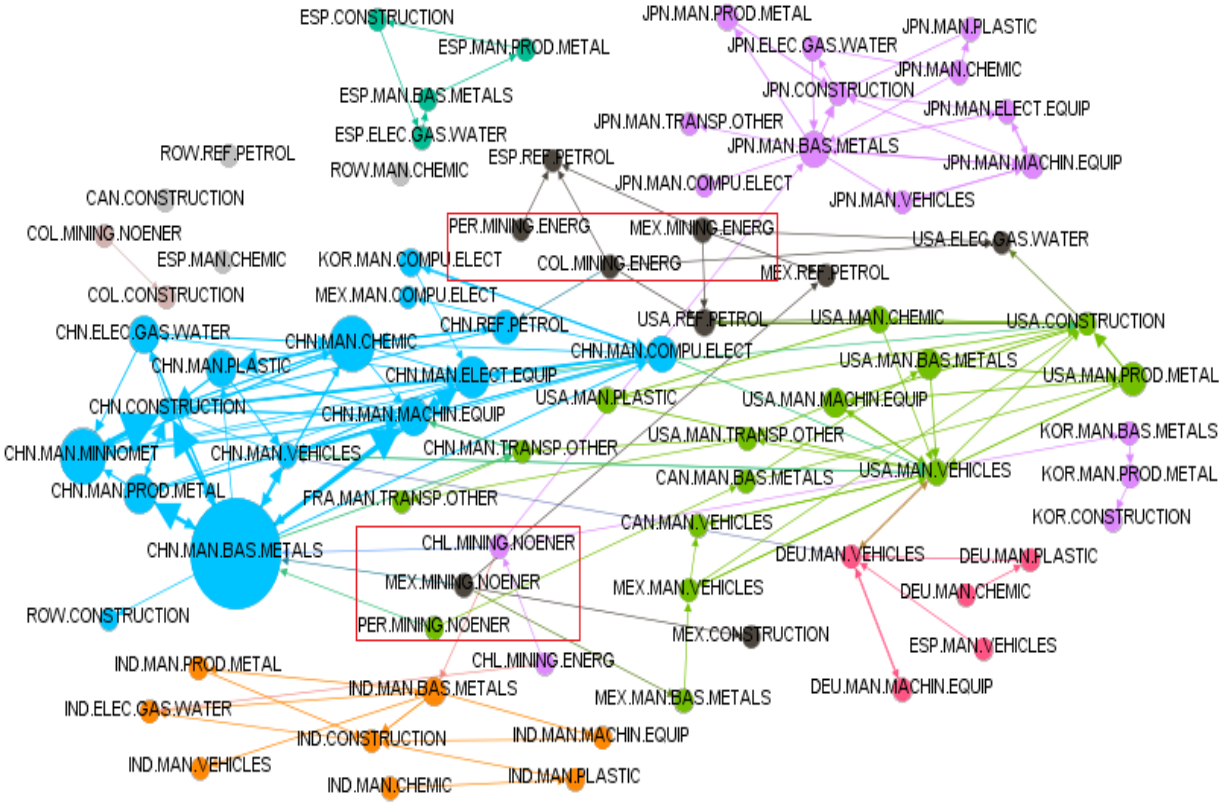
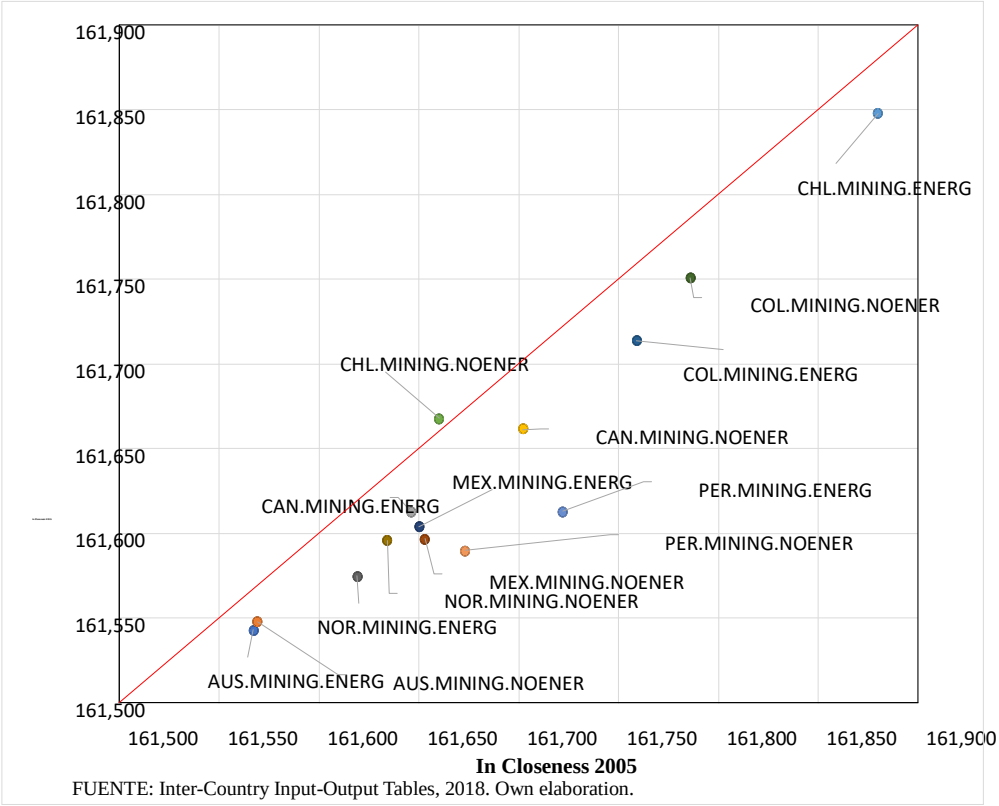


Figure 4. Participation of the Pacific Alliance in segments of world production with intensive use of minerals and hydrocarbons, year 2015. Data: OECD, 2018. Software used: Gephi 0.9.2. Own elaboration.

Besides, one way of evaluating to which extent mining extraction has a drag effect on supplier countries is by calculating its closeness index, as it has been done in Figure 5. In this case, the number of backward jumps a node which must make to reach the entire network which is being counted. Therefore, the higher the index is, the less connected the sector is, and it will not be able to transfer the impact of its growth so easily. In this figure, Australia, Canada, and Norway's mining sectors have been added as reference values for the Pacific Alliance. Although the level of connectivity has improved in almost all cases (figures in 2015 are below the diagonal), Australia and Norway's extractive industries reflect a greater production linkage, while the position of Colombia and Chile reflects the weakest linkages. Peru and Mexico's industries show a better position, although below the developed economies abovementioned.

Such weakness in the backward production linkages of the Pacific Alliance countries also appears when the extractive industry and its links with local suppliers are evaluated. This is demonstrated in the publications of Correa (2016) for Chile, Martínez and Delgado (2018) for Colombia, Pérez (2017) for México, and Barrantes, Cuenca, and Morel (2012) for Perú. The outcome is that the growth of global demand for minerals and oil does not expand backwards through market channels, and the government must create distribution mechanisms to relieve social tensions coming with the extractive activities.



FUENTE: Inter-Country Input-Output Tables, 2018. Own elaboration.

Figure 5. Closeness index of the energy and non-energy industries in the Pacific Alliance and other reference countries, years 2005 and 2015.

Environmental Instruments and Resource Rent Capture and Distribution in the Pacific Alliance

International trade and foreign investment openness policies applied in the Pacific Alliance let us evaluate the direct impact of the GVC production boom on their extractive industry, and their corresponding sustainability policies, without the complications that could arise from very closed economies.

Instruments for Weak Sustainability

In the process of transformation from natural capital into manufactured capital, the importance of mechanisms implemented by the government for capturing the resource rent stands out. In fact, this capture is made through all the taxes, duties, and contributions that extracting companies must pay, taxes coming not only from a direct tax regime, such as corporate, dividend, and in some cases, profit remittance taxes; but also those coming from an indirect tax regime, such as the value-added tax; and special tax imposed on the extractive industry. Table 1 shows a summary of the mechanisms used in the Pacific Alliance countries for capturing and distributing resource rents. Beyond the general corporate tax, regulation in these four countries includes specific taxes imposed on extractive activities. Given that in Chile, Colombia, and Mexico, the participation of government-owned companies as direct operators of wells and mines is important, their contribution to the national treasury is special. The most relevant case is the Pemex Mexican Company, which profited from the monopoly on oil extraction until 2015. In Peru, the corresponding government-owned company, Petroperu, has no extractive, only refining activities, simultaneously with transnational companies.

Table1

Resource Rent Capture and Distribution in the Pacific Alliance

	Chile	Colombia	Mexico	Peru
Resource	Mining	Hydrocarbonsand mining	Hydrocarbonsand mining	Mining and hydrocarbons
Corporate tax	27%	25%	30%	29.5%
Special taxes on extractive activities		Taxes and dividends from Ecopetrol (State owned). Oil royalties. Fees for specific reasons. Extraction fees.	Pemex dividends (State owned). Hydrocarbon extraction fees (State owned). Oil base royalty and additional royalty (private).	Oil royalty with progressive rates. Gas royalty with progressive rates.
	Tax on CODELCO (state owned). Mining royalties with progressive rates. Mining extraction license.	Mining royalties with progressive rates. Fees for specific reasons Extraction fees.	Ordinary mining fees (quota per hectare). Special and extraordinary fees on mining (percentage).	Mining royalty with progressive rates. Mining fees. Special mining tax or special mining contribution with progressive rates.
Capture scheme	Central government	Central government	Central/federal government	Central government
Distribution scheme	From 1976 to 2018, the Copper Reserve Law allocates 10% of the exports value to the Armed Forces. In 2011, the Regional Investment and Restructuring Fund (RIRF) is created. One third of the fund goes to the producing regions and two thirds to the rest of the fund. Municipalities are required to make an application for the funds.	In 2012, the National Royalties Fund is created which serves to finance stabilization funds, extractive regions, pension savings, science and technology; regional development and compensation, among others. Regions are required to post their investment projects for funds.	1. Funds for national and federal budgets. Since 2014, the Mexican Petroleum Fund has been created. 2. Special funds for producing States.	In 2004, 50% of the corporate tax *(canon)* to the gas/oil/mineral extracting region. 100% of the royalties to the gas/oil/mineral extracting region. 75% of mining fees to extractive municipalities. 100% of the special mining tax or special mining contribution with progressive rates is retained by the central government.
Expenditure regulations	Money from the RIRF must be used in regional and municipal development projects.	Although without a defined parameter, the royalty fund is used for investment projects. Special fees are used to compensate environmental and even cultural impacts.	1. They are used for balancing budgets, hydrocarbon funds, science and technology expenses, and as a reserve fund. 2. Physical investmentwith a social, environmental, and urban development impact and infrastructure projects to compensate damages caused by extraction.	100% of the amount received by the municipalities should be allocated to infrastructure and scientific & technological research in universities.

Sources: Own elaboration based on EITI (2019), PWC (2019), and Viale(2015).

As for private extraction, royalties and extraction fees are currently charged in these four countries. In Chile and Peru, since 2010 and 2011, respectively, mining royalties are imposed with progressive tax rates which are charged based on operating profits. In Colombia, oil and mining royalties are progressive, but with respect to the total value produced. In Mexico, state-owned hydrocarbon companies pay extraction fees, while private companies pay royalties, in both cases, these are progressive amounts calculated according to market prices. In mining extraction, a base fee charged at a fixed rate on profits is paid.

In these four countries, the mechanism for collecting taxes is centralized, since it is based on the principle that natural resources are owned by the nation/state, which also determines how it is distributed.

In general, if we compare the tax revenues and non-tax revenues from the extractive industry—published on ICTD (2019)—with the resource rent published by the World Bank, the amount captured from the extractive sector in 2011 is a small part of the sum theoretically estimated, 23% for Chile; 39% for Colombia; 85% for Mexico; and 22% for Peru. The high percentage in Mexico is explained by PEMEX's control over the oil extraction industry and the contribution of an important percentage of its revenues to the budget of the Mexican government. Conclusions suggest that the amount captured is less than the sum that could be charged, which agrees with the findings by Fuss et al. (2016).

Although since the end of the last century the Pacific Alliance countries have implemented trade liberalization policies with tax strategies to promote foreign investment, the strong growth of global demand for minerals and oil during the first decade of this century changed the calculation method of the resource rent to be captured and its internal distribution. In Chile in 2011, the Regional Investment and Restructuring Fund (RIRF) was created, for the centralization of the obtained royalties; in Colombia in 2012, the Royalties National Fund was created with a similar purpose; and the Mexican Petroleum Fund was created in Mexico in 2014. Regarding the destination of such funds, in Chile, the money is used exclusively for investment projects; a third of the total amount is allocated to the extractive region and two thirds to the rest of the country. In Colombia and Mexico, such funds are not only used for investment project financing and for science and technology development, but they are also a source of income for the national and federal budget, without a specific spending destination.

In the case of Peru, royalty payment was introduced for the mining sector in 2004, and in 2011, two additional alternative taxes were introduced: a special contribution for those companies that had previously a tax stability agreements or, a special tax, for those who have not. Although the collection of all these contributions is centralized, there is no specific national fund created with this money. Furthermore, since 2004, 50% of the corporate tax is allocated to the producing regions under the concept of canon, and it is then distributed in established percentages to the extractive district. In the case of royalties, 100% is allocated to the extractive region. The destination of both contributions is exclusively for infrastructure and higher education investment. However, 100% of profits from contribution or mining special tax is retained by the central government and does not have a defined expenditure item.

In fact, the structure of collection and expenditure of what we called resource rent is more complicated than what has been described in this paper, since it deals with tax regulations that have been created throughout many years, one after another, in many cases as a complement to a previous regulation and not as a substitute. Although the creation of national funds and the following allocation of a percentage to the extractive region are predominant procedures, specialized literature on fiscal decentralization does not offer any specific criteria for estimating the percentage that should be distributed inside the country (Brosio & Jimenez, 2012). The transfer to the extractive region is 1/3 of the fund in Chile, in Peru it is 50% of corporation's tax, while Colombia and Mexico have no defined percentages. What is the appropriate amount?

Nevertheless, we see that Chile, Colombia, and Mexico choose to take advantage of the efficiency benefits of centralized resources when creating national funds, thanks to potential scale economies which happen when financing national scope projects. Peru, using its distributional mechanism, has chosen an equity criterion, as the use of distributed funds, although almost atomized, would reflect better the preferences of the extraction regions.

On the other hand, in terms of the possibilities to substitute natural capital for manufactured capital allowed by law, in Chile and Peru there is a more explicit obligation to use the captured money for

infrastructure investment aimed to create benefits of long-term, while in Colombia and Mexico, they prefer to guarantee the national budget balance, in the short and long term.

In general, the boom in the world production of GVCs that make intensive use of minerals and oil has forced a strengthening of the resource rent capture and distribution mechanisms in the Pacific Alliance. However, such mechanisms do not ensure resource rent transformation into manufactured capital, which would not meet the basic principle of weak sustainability.

Instruments for Strong Sustainability

In these four countries, environmental management as a national policy has gone through a process of organizational development, since it starts as the responsibility of one office within a larger entity (in some cases the Ministry of Agriculture) and years later it achieves the status of ministry. The respective ministries of environmental management were created in 1993 in Colombia, in 2000 in Mexico, in 2008 in Peru, and in 2010 in Chile. Colombia was the first one who seeks to harmonize the defense of biodiversity housed in the forests covering 52% of its territory and the rights of the 84 existing indigenous ethnic groups, with their needs for oil extraction as the country's most important source of foreign currency.

In all four countries, one of the main regulatory tools is the environmental license required for extractive investments. Although environmental licenses already existed prior to the creation of the aforementioned ministries, the economic pressure for the extraction of resources since the 1990s and the resulting conflicts forced them to change from a mere administrative requirement (MINAM, 2016) to a rule that nowadays includes control mechanisms and economic sanctions.

It has been used in Colombia since 1993, and in 2009 sanctioning regulations for non-compliance were included. The Environmental Superintendence was created in Chile, in 2010 and is empowered to sanction and suspend extraction licenses. In Mexico, a legal mechanism regulating environmental impact assessment was approved in 2000, and added in 2002 the corresponding attorney's office with the ability to sanction. In the case of Peru, in 2001 the procedure of environmental impact assessments was standardized, which was before defined independently by each ministry, in 2008 powers were given to the regional authorities for their approval, and in 2010, auditing and sanctions are standardized.

The growth of GVCs that make intensive use of minerals has also intensified conflicts of environmental and social origin in the countries evaluated. If the risk of environmental conflict is already linked to the extractive activity, this problem is intensified by a social component, mostly as a result of the gap between labor and productive capacities prevailing in the area versus those capacities that are required by the extracting company. Then, both the absorption of local labor by the companyand the supply of local goods and services are very limited. Thus, there is no production linkage established, which do exist in integrated economies enabling the corresponding creation of market channels that facilitate income distribution, at least better than the one given in our study cases. The result is a potential social conflict, which is even more acute when it comes to indigenous peoples who, prior to the extractive boom, were already among the poorest population in the country.

In this context, prior consultation was incorporated in the legislation of the evaluated countries as a mechanism to allow indigenous or native population to be taken into account in any legislative or administrative measure that the government intends to approve and which affects them directly, putting into practice the regulations included in the ILO-convention 169, held in 1989. Thus, in 1993 in Colombia prior

consultation was included in the legislation that organizes the Environmental Management System, and in 1998, it was implemented. It is worth mentioning that in 2015 a new requirement was added; companies were compelled to develop and execute a social management plan with programs and projects approved by the corresponding authority, a rule that is not found in the rest of the countries. In 2003 in Mexico, the law creating the National Commission for the Development of Indigenous Peoples where prior consultation is included was approved. In 2013, a protocol for its implementation was declared. In Chile, this mechanism is introduced in 2008 and regulated in 2013; while in Peru law was approved in 2011 and established in 2012 (Freire & Perez Serrano, 2016).

These rules show the creation of the government's regulatory tools, still weak in implementation, in the attempt to allow the use of natural resources in benefit for the entire nation, but ensuring the sustainability of the various environmental services towards the society as a whole, with emphasis on the most vulnerable populations, who lack their own defense mechanisms to encounter environment deterioration.

Conclusions

As minerals and oil are basic industrial inputs, they participate in several production segments comprising various GVCs. However, in the evaluated period, construction industry stands out for its largest purchase volume, and vehicle manufacturing industry stands out for its high level of linkage. Thanks to their drag capacity, both industries have gathered intermediate industries, such as the chemical industry, and metal manufacturing, among others, to consume the basic raw material, thus strengthening the extractive activity of various global suppliers.

Countries whose industries have exercised the role of largest direct buyers of minerals and oil have been China, Korea, USA, India, and Japan, while the Pacific Alliance countries are among the most important suppliers of such demand. Although foreign demand impulse should have favorable effects on the connected industries, the low level of linkage shown by the closeness index reveals that this demand benefits were not contagious enough to other industries, which reduces the distributional impact of growth through market channels. This low linkage occurs even the level of the industry located in the extraction area, creating, on the one hand, possibilities of growth in the country's aggregate accounts, but, on the other hand, with social tensions at a district level, as a part of the nearby population cannot benefit from extractive activities.

Therefore, the government is obliged to create instruments of resource rent capture and apply distribution mechanisms, replacing to a certain extent the market channels. Although the four countries evaluated receive royalties for mining and oil activities, in Chile, Colombia, and Mexico the creation of national funds predominates, in which the item of expenditure is not necessarily the productive investment, and the territorial destination is partly the extraction area. Only in the case of Peru, regulation requires the use of money in investments generating future income and with a specific territorial allocation. One effect of such policy in this country is an income inequality intensification in subnational budget at a territorial level and the investment atomization in provincial and district scale projects.

On the other hand, the extractive boom of the 1990s forces the government of the countries evaluated to add regulations that reduce environmental degradation as a purely administrative requirement first, but then sanctioning bodies were added, thus strengthening their application. Regarding the protection of the rights of the most vulnerable populations located in the extraction areas, although there has been a progress in establishing the corresponding rules, their real empowerment is still under construction.

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Journal of US-China Public Administration
Volume 17, Number 2, Mar.-Apr. 2020

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ISSN 1548-6591