

**AN INVESTIGATION INTO THE PROBLEMS FACED BY
RESETTLED COMMUNITIES IN YAN OYA RESERVOIR
DEVELOPMENT PROJECT IN SRI LANKA**

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Thesis/Dissertation submitted in partial fulfillment of the requirements for the
degree of Master of Science in Project Management

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DECLARATION

I declare that this is my own work and this dissertation does not incorporate without acknowledgement any material was previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief it does not contain any material was previously published or written by another person except where the acknowledgement is made in the text.

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ABSTRACT

AN INVESTIGATION INTO THE PROBLEMS FACED BY RESETTLED COMMUNITIES IN YAN OYA RESERVOIR DEVELOPMENT PROJECT IN SRI LANKA

This research is based on resettled communities who were resettled due to ‘Yan Oya’ Irrigation Project in Eastern Sri Lanka which was completed in 2018. The problem was, ‘what are the socio-economic problems faced by resettled communities, who were resettled due to ‘Yan Oya’ Irrigation project Hence,

the aim of this study explores the socio-economic problems of the resettled communities of Yan Oya Reservoir Development Project (YORDP) and focuses on the identification of different problems of the resettled communities .

A comprehensive literature was conducted to acquire knowledge on characteristics of development projects, irrigation projects, concept, theories, relocation process, reasons for relocation, proper relocation, facilities for relocations area, importance to livelihood, involvement party for relocation process, effect for health and safety for resettled people, environmental effect and type of compensation on YORDP.

To understand problems of resettled people on YORDP, data was collected from the people who had been relocated to Malporuwa, Omarakada, Kajuwatta and Wahalkada areas in Anuradhapura district in Sri Lanka as a result of YORDP. The research was carried out adopting a quantitative research approach and the data collection was done through a questionnaire survey. The questionnaires were distributed by hand among the resettled communities.

Relative Importance Index (RII) method was used to analyse the problems of the resettled communities on YORDP in Sri Lanka. Based on results, 11 problems were identified as low and very low impacted problems, 15 problems were identified as moderate impacted problems and 9 problems were identified as highly and very highly impacted problems for the resettled communities. Among those problems are seasonal flood in relocated areas, lack of involvement by government to supply the drinking water, destruction of paddy cultivation by wild life, inadequate compensation for lost paddy lands, received land area inadequate for cultivation, less income from paddy land and less income from chena lands can be identified as the highly and very highly impacted problems of the resettled communities. In the recommendation, taking necessary measures to control floods, reimbursement of reasonable compensation for lost property, controlling wild life migration, enhancement of livelihood and establishing ways to meet the drinking water requirement of the resettled communities are identified as major actions.

Keywords; Development projects, Resettled Communities, Problems, Resettlement, Yan Oya Reservoir Development Project (YORDP)

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LIST OF ABBREVIATIONS

HH	-	Houses Holder
IDP	-	Irrigation Development Project
NWSDB	-	National Water Supply Drainage Board
PL	-	Paddy Land
RI	-	Relative Indices
VD	-	Valuation Department
YORDP	-	Yan Oya Reservoir Development Project

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Appendix A	Preliminary Interview Guideline
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CHAPTER 01**INTRODUCTION**

1.1 Background

Sri Lanka has undertaken a series of development projects over the past few decades to improve water resource management and encourage inland settlement. Sri Lanka is a small island near the south of the Indian subcontinent with a land area of 65,000 km², located a few degrees North of the equator in the Indian Ocean. Its economy is mainly based on agriculture including among these, tea, rubber and coconut are important. Tourism and apparel production industries are also the main foreign exchange earners to the country. According to the view of Warf (2017) it was experienced an extreme civil war between the Sinhalese majority and Tamil minority in the North that left tens of thousands dead.

As per the findings of Balasooriya, Wehella and Wijeratne (2010) the annual growth rate was 1.2% and the population of Sri Lanka was 19.5 million in 2006 and it was projected that by 2020 the population will be risen to 22 million and the decrease in the rate of population growth would allow the authorities to devote more money to improve the standard of the education sector. Balasooriya et al (2010) mentioned with 72% of the population in rural areas, 21% in urban areas and 6% in the plantation sector and as a developing country Sri Lanka has per capita income of US\$ 1030 per person, explaining that the economy expanded at a 7.4% growth rate of real gross domestic product (GDP) in 2007. According to the view of United Nations Environment Programme (UNEP, 2013) they raised unique environmental issues and created urban development opportunities that can contribute to the wider objective of improving urban dwellers' living conditions and sustaining a high degree of global sustainability. Due to demand opportunities, cheap labor, etc., this trend in urban growth drew investors to Sri Lanka.

In rural areas new villages need a solid and strong financial capacity which will achieve their needs and other requirements, but government ability is often beyond on the inadequate financial capacity. Since it is difficult to provide appropriate infrastructure and other necessities for life to meet and sustain more than 750 resettled communities from the government. In the context of adverse situation for emerging villages, the government has decided to take the challenges to a positive level by utilizing the resources (people, material, equipment, money etc.) and making a big difference in the condition of the people living in the villages. This leads to the proposal for development projects.

In the Oxford Advanced Learners Dictionary “development” is [uncountable] the gradual growth of something so that it becomes more advanced, stronger, etc. Furthermore, it is synonymous to growth or new event. According to the Merino and Carmenado (2012) various types of development projects are primarily aimed at eradicating poverty and improving the lives of indigenous peoples and one of the commonly used strategies is to focus on the organization and develop existing features.

Based on findings Enemark and Ahene (2002) rural development projects have traditionally evolved from a natural resource, low labor costs, taxes, and a regulated economic perspective for recruiting businesses in rural areas and construction can be more important to develop than traditional technology exchange systems.

The Sri Lankan government has embarked on bold development projects with capital requirements. Among these projects, Port City development project in Colombo with 269 hectares of reclaimed land and capital is \$1.4 billion was one of the biggest project in Sri Lanka. Another project is Megapolis and Western Development project accounting for 15 years and \$ 40bn worth. This project aims to raise GDP of Western region people by \$230 billion by 2030 in Colombo area. Also Hambantota International Port Services and government has planned an emerging Trade Center in Hambantota connecting Colombo city by Southern expressway which is due to be implemented by China Merchants Port Holdings Company

(CMPH) and Sri Lanka Port Authority's (Construction & Real Estate chapter of The Report: Sri Lanka, 2018). As such The Yan Oya Reservoir Project was launched in Anuradhapura district including Right Bank Main Canal and Left Bank Main Canal in year 2014. In today's global business world, megaprojects from an increasingly important concept in development. As a result of this, evolving global networks, growing cooperation between multiple partners and difficulties managing such ventures can be shown as the significant factors of it. Global sponsors, funding organizations and contractors from many nations are also interested for these projects. Spending of long time period, involving of several partners and contractors with different interests, utilization of modern technologies and complexities of the external environment add to the immense complexity of construction projects. These are just a few of the factors. Among these projects Yan Oya Reservoir Project is also one of the development projects in Sri Lanka and also this project will have a huge impacted to improve the lifestyle of the people in the rehabilitated areas of Malporuva, Kajuwatta, Omarakada and Wahalkada to sustains the state economy.

A government must take great care to initiate large development projects. According to the Sturup (2009) large development project is complex and risky businesses, since it requires proper design, modern technical skills, competence and talent, expert management skills and good knowledge of large-scale investments. Development Projects create a high degree of political and public concern since they have both positive and negative influences on the relocated communities and do not account for environmental impacts.

The research investigates the resettled people's problems on YORDP in Sri Lanka. Previously resettled people were home to Kapugollewa, Maradamaduwa, Pahala Divulwew, Wagollakada, Galkadawala & Kandamalaw in Gomarankadawala and Horawapathana Divisional Secretary zones.

1.2 Definition of resettled community

Geekiyanage, Keraminiyage, Fernando, and Jayawickrama, 2021 found Post-disaster resettlements can be classified broadly into two types: rebuilding original dwellings (often with the active participation of householders in the building process) and permanent relocation to new settlements.

Community resettlement becomes the ultimate choice for communities devastated by disasters and resettlement of disaster-prone communities away from their original locations leads to numerous economic hardships and social disturbances (Siriwardhana, Kulatunga, Samaraweera, and Shanika, 2021).

Based on above literature review resettlement community is who were the people of moving from one place to another place with required infrastructure facilities to lived due to the disasters or development activities in the country.

1.3 Research Problem

The Government of Sri Lanka intends to improve the express ways, railway system, water supply, hydropower system and housing systems etc. to enhance quality of life of Sri Lankan inhabitants. It was happened in past as well as will be happened in future also. But resettlement experiences regarding development projects are not fair at all. The intended outcome of development project is to ensure the sustainability of environment as well as livelihood resettled people. It should consisted with participatory approaches, habitable spaces, social security and safeguard systems, reasonable land acquisition policies and fair involuntary resettlement policies. Unfortunately, involuntary resettlements projects have not been succeeded in expected levels in Sri Lanka still. There are various difficulties and problems experienced by resettled communities from Mahaweli project development resettlements to Yan Oya project resettlements. Moreover, Kapugollewa, Maradamaduwa, Pahala Divulwew, Wagollakada, Galkadawala & Kandamalaw communities were resettled due to the YORDP in Anuradhapura district Malwatta and Subasinghe (2021) identified major issues faced by resettled person due to YORDP as (a) problems in allocation of lands, construction of houses, payment of

compensation and other allowances,(b) economic difficulties,(c) environmental issues,(d) educational losses and challenges,(e) infrastructure matters, and (f) social relationship gaps/less social cohesion. The authors further highlight the importance of investigating the socio-economic problems faced by resettled person of YORDP. Some of the problems include destruction of paddy cultivation due to the floods, difficulties of obtaining drinking water for the resettled communities, destruction of paddy and chena cultivation by wildlife, problems on the loosened paddy lands resettled of communities, poor infrastructure facilities, loss of livelihood and bad environmental effects.

The findings of this study will enable to identify specific areas that need to be considered when designing an irrigation rehabilitation project to reduce the negative impacts related to socio-economic factors. Policy makers can compile all research findings related to post resettlement experience when they design a new project.

1.4 Aim and Objectives

The aim of this research is to explore the socio-economic problems of the resettled communities of Yan Oya Reservoir Development Project (YORDP) in Sri Lanka.

The objectives of this study are as follows;

- 1 Investigate the prevailing practices of resettlement due to irrigation project in Sri Lanka.
- 2 Identify the demographic information of the displaced people due to the YORDP.
- 3 Investigate the attitudes of resettled communities towards resettlement due to YORDP.
- 4 Investigate the problems faced by the resettled communities on YORDP.

1.5 Methodology

The methodology was adopted to achieve the aim and objectives of this research. The research commenced with literature survey by referring to journals, articles, books, conference, dissertations, government publications and World Wide Web (WWW) using to understand and capture the background of the resettled community problems on the development projects. On the literature review and interviews were held with the resettled communities to obtain input for create questionnaire, especially identifying problems and way to manage them. Then, a detailed questionnaire survey was conducted to identify the resettled community's problems on YORDP in Sri Lanka under the quantitative research approach. Samples were collected from the leader of each house of the villages those were effected to YORDP. The collected data through questionnaire survey was analyzed by using Relative Importance Index method.

1.6 Scope and Limitations

The research is limited for development projects and problems they created for resettled communities and the case of Yan Oya Reservoir Project in Sri Lanka. In one of these houses, sub families live in addition to the main family. Only the main family members were selected for the survey.

1.7 Chapter Breakdown

Chapter 01 - Introduction

Background of the research topic, aim and objectives, research problems scope and what are the limitations, methodology are briefly discussed in this chapter.

Chapter 02 – Literature Review

Chapter the literature to review was done to identify the concept of development projects, characteristic of development project, what are the significant factors to be consider resettled the communities.

Chapter 03 – Research Methodology

This chapter is discussed Research process, data collection and analysis techniques.

Chapter 04 – Data Analysis and Results

Chapter 04 reveals analysis of collected data and what are the findings of the research.

Chapter 05 – Conclusion and Recommendations

Chapter 5 delivers the research achievements, aim and the objectives, recommendations and directions for the future research are discussed in this chapter.

CHAPTER 02

LITERATURE REVIEW

2.1 Introduction

This section explains an overview of the literature published by other researchers that is applicable to the current analysis. Then available literature is reviewed to meet the objectives in the research report. This chapter has been included Characteristics of Irrigation Project, Development project in developing countries, Importance of Irrigation project, Social impacts on YORDP, Positive and Negative impacts on YORDP, changes in land use, impact assessment in relocation processes and rural development.

According to the view of authors they have identified various characteristics in development projects. Grun (2004) describes them as giants among the projects and make great emphasis on multi-organizational business (MOEs). Hassan, Caffer and Thorpe ,1999 based found five requirements for high capital, those are spending, "long-term" urgency of long-term programs, demand for technology and supply, inputs from various disciplines and organizations that need and guide them and virtual company implementing the project. According to the view of Fenema, Rietjens and Baalen (2016) socio-economic, institutional support and infrastructure restoration (reconstruction) are focused under international development projects.

Das and Ngacho (2017) mentioned Development projects not like a large construction projects, it is essentially community-driven in nature and aim at redistributing national resources to the community to bring facilities and services closer to people in order to alleviate poverty, job opportunities, raise up the living standard of people, through proper schools, health and safety facilities and the like. Meanwhile Arango, Jaramillo, Monsalve, Hernandez, and Botero, 2019 highlighted potential to minimize environmental, economic and social impacts during the construction stages are the parameters of sustainability in the development projects.

Capka (2004) opined in the expensive projects need to be manage modern and complex activities, while maintaining tight schedules and tight budgets.

Das et al. (2017) pointed out main aims are Development Projects, achieve social and environmental goals, economic goals and also funding are provided for those projects by national governments basically to address the socio-economic needs of citizens while at the same time minimizing the negative environmental impact on the surrounding area. The magnitude of the project's complexity depends on a price tag of over a billion dollars and the time frame more than five-year limit.

2.2 Introduction of Resettled Community

Resettlement refers to the process by which individuals or a group of people leave spontaneously or unspontaneously their original settlement sites to resettle in new areas where they can begin new trends of life by adapting themselves to the biophysical, social and administrative system of the new environment (Perera, ,Weerasoori, and Karunarathne, 2012).

The resettled community faces obstacles in adapting to a built environment. Besides, the host community's built environment gets modified as a result of the presence of the new community, consequently, the host community too is confronted with adaptability issues (Sridarran,Keraminiyage,and Amaratunga,2017).

2.3 Characteristics of Irrigation Projects

According to the view of the Social and Economic Rights Action Centre (SERAC, 2007) Characteristics of the development projects can be classified on the nature, extent and scope of the project; those are

- They are physical structures of immense magnitude.
- Take it long time complete the project.
- They are typically located in remote areas on the requirement of the large amount of land area.
- It involves with high financial capacity.
- They face financial challenges on the contentious ventures of the project.

- A government or private company is frequently the project proponent.
- The projects are generally initiated and funded by a consortium of contractors who need assistance, normally privately owned and financed.
- Development projects require highly trained employees, proper program planning especially in the field project management.
- Communities are accepted or rejected development projects on social, economic, environmental and political impacts.

2.4 Development Projects in Developing Countries

Xu, Wang, and Tao, 2018 explained the construction industry is critical for global development by improving the sustainability of the constructions immediately, especially in developing countries. The large part of the infrastructure services highly depends on economic development and the welfare condition of the citizens, therefore it significantly affect to the population and business activities as positively and negatively. Major highways, mineral and oil exploration, reservoirs, hydroelectric plants and massive real estate development are defined as the some of the Development Projects in developing countries. (Xu et al., 2018)

2.5 Introduction of Irrigation Projects in Sri Lanka

The Mahaveli Development project was one of the largest integrated rural development schemes in the world and it was formally launched in the late 1960s and subsequently accelerated in the late 1970s by a newly elected government" (Muggah, 2008). Mahaweli Development Project was implemented with the assistance of countries such as Britain, Germany, Canada and Sweden.

Since independence from colonial rulers, Sri Lanka has also often sought to benefit from the wisdom of 'Western' development models with successive governments trying to reform the country's agricultural sector in accordance with the 'laws of development' imposed by Western countries; (Gunatilake, 1998; Tennekoon, 1988). According to the view of Paranage (2019) the Mahaweli Development Project (MDP) is the largest irrigated agricultural development program in Sri Lanka and also it is the biggest agriculture development projects in the world.

Emma, Shipley, Vlahos, Chandrajith, and Wijerathna, 2022 pointed out the Sri Lanka has undertaken a series of development projects over the past few decades to improve water resource management and encourage inland settlement Reservoir systems built in these areas allowed to increase rice production by one to two cycles per year and this effort helped meet the country's domestic rice demand in 2012. Paranage (2019) explained this effort came after the completion of the Mahaweli development programme, which created new reservoirs and introduced irrigation over 1,000 km of land in the central arid region.

2.6 Importance of Irrigation Projects in Sri Lanka

Paranage (2017) found currently 31.8% of the population involves in agrarian activities and Sri Lanka has a long history about irrigated agriculture activities. Gunda et al., 2015; Wickramasinghe, 2014 highlighted some of the Agricultural activities such as forestry and fishing accounted for 18% of the GDP (gross domestic product) in 2014 and also as approximately 26.4% of workforce are involved in these sectors.

Silva & Hornberger (2019) explained Multipurpose reservoir are engaged with various operations, those are hydropower generation, supply of drinking water, tourism, irrigation activities, flood controlling system and navigation, same as Mahaweli multipurpose water resources system also in Sri Lanka contribute water for irrigation activities , hydropower generation, supplying about 20% of the annual irrigation water demand and 20% of the electrical energy demand of the country and also Mahaweli water managers must consider spatial and temporal variability of hydrology across the cascade system, limitations of installed infrastructure and trade-offs among competing demands of hydropower and agriculture.

2.7 Social and Cultural impacts on YORDP

Mahaweli Consultancy Bureau Private Limited [MCBPL], 2013) found social and cultural impacts on this project, those are

- Changes /disturbances to life style
- Conflicts between resident and migrant people
- Relocation of income generation activities
- Changes in economic infrastructure

2.7.1 Changes /disturbances to life style

MCBPL (2013) explained, resettled communities had a traditional tank village culture and living styles fashioned based on interactions among them based in turn on that culture. Those interactions have built up cooperation between them that includes collective labor sharing activities such as attam and kayas that support their daily lives and periodic agricultural activities and continue to the present day in these areas and these communities of rehabilitation project. (MCBPL, 2013)

2.7.2 Conflicts between resident and migrant people

Central Engineering Consultancy Bureau [CECB] (1994) explained project development plan, the residents living in the flood zone of the proposed project will be relocated with the commencement of the project conflicts between migrant workers and residents cannot be predicted during the construction of the project. The people living around the areas under the proposed reservoir structures and canals will continue in their housing (not relocated) during the project implementation period, expecting positive economic benefits such as employment opportunities to these communities, enhance commercial activities in the area and develop existing infrastructure etc. (MCBPL, 2013).

2.7.3 Relocation of income generation activities

MCBPL (2013) explained due to this project their agricultural land and existing irrigation canals will be submerged, hence their main source of income agriculture works will be severely hampered by the implementation of the proposed project and the next important source of income of this area will be working as home guards basis on fixed monthly. In other words, they are likely to lose their jobs because their services are no longer needed (CECB, 1994).

2.7.4 Changes in economic infrastructure

As a result of the proposed project, infrastructure such as electricity, telecommunications, water supply and marketing facilities were disappeared in the submerged area and facilities were available for resettled communities outside of the project area also. (CECB, 1992).

2.8 Positive impacts on YORDP

MCBPL (2013) found positive impacts of the YORDP, those are

- New road network
- Ending the isolation
- Agricultural development
- Improving the health status of people.
- Drinking water supply
- Increased commercial activities (Access to markets)
- Employment opportunities
- Increased property values

2.8.1 New road network

MCBPL (2013) pointed out Anuradhapura and Trincomalee districts were connected by YORDP with a wide road over and the main dam was acted as a bridge to connect the communities living in these two districts. The newly developed road network will connect the two districts and two provinces along with

Gomarankadwala, Sripura and Kachhaveli in Trinamali district and Horovpothana, Kabithigoleva and Padavia in Anuradhapura district (CECB, 1992).

2.8.2 Ending the isolation

Some expectation was the project to end the segregation of villages as an adverse consequence of the War on Terror and main adverse consequence of the war was the fear mentality built into society (MCBPL, 2013).

2.8.3 Agricultural development

CECB (1994) explained there were several abandoned ponds located along the proposed right and left main canal paths but those smaller ponds and irrigation systems had been abandoned for various reasons by the people. CECB (2006) pointed out number of small irrigation tanks were situated along the proposed Left bank & Right bank canals among those some tanks were being used by farmers partially and some were totally abandoned, since this project would definitely rehabilitate all small tanks situated along the both canal paths as they will be fed by the proposed reservoir, helping to restore the ancient irrigation system and human settlements.

2.8.4 Improving the health status of people and Drinking water supply

Gunarathene, Kumarie, and Pereara, 2016 reported kidney diseases were common in proposed project areas and main cause was poor quality of the water used by the communities. MCBPL, 2013 explained as the national agency, National Water Supply and Drainage Board (NWSDB) should take necessary arrangements to provide the safe drinking water to the people of the country and currently they are facing the problem of finding reliable water source in the area and lack of required quantity of water. MCBPL, 2013 explained proposed YORDP was a reliable water source that could be used by the NWSDB to process and supply drinking water to the people living in the area.

2.8.5 Employment opportunities

MCBPL (2013) explained as per the project plan around 2000 people involved in the peak time to construct the Mainly Dam, Main canal and many sub-construction components. Malwatta and Subasinghe, 2021 mentioned unskilled jobs and skilled jobs were created directly to the construction works and supplying of materials, catering services, renting houses, food and beverages to the local people were indirect income generation activities to surrounding communities.

2.9 Negative impacts on YORDP

Malwatta and Subasinghe (2021) found negative impacts of the YORDP, those are

- Problems in allocation of lands, construction of houses, payment of compensation and other allowances.
- Economic difficulties
- Environmental issues
- Educational losses and challenges
- Infrastructure matters
- Social relationship gaps/less social cohesion

2.10 Social and environmental impacts of land use changes Irrigation Project

According to the findings of some authors Nayak & Mandal (2019) land is one of the world's primary vital natural resources and it is directly influenced by the functions of the environment, humanity's survival and long-term economic growth and land use has increased human demand for the land.

Land is one of the major factor along with labor and capital in classical economics production. It was the backbone of the agricultural economy and lands are provided high contribution for the agricultural activities. Meanwhile it is provided essential input for housing construction and food production which in turn affects the economy of the society. Food and timber production have reduced on the conversion of farm lands and forests in to the cities. According to the findings of some authors such as Vavra, Duzi, Lapka, Cudlinova, and Rikoonb, 2019 soil erosion has a severe

adverse effect on agriculture and the environment problems and it is covered by various research aims such as understanding the social, cultural, policy and economic context of the problem.

As a result of urbanization, serious questions are arisen about agricultural lands and nonagricultural lands among the farmers. This was negatively effects to the agriculture and it was led to increase the local subsidies for farmers. A farmer may have to pay more inputs or spend more time repairing equipment due to inadequate demand for agricultural inputs, closing the nearest input suppliers (Lynch and Carpenter, 2003). When the total cost of farmland falls below, labour costs may raise in the nonagricultural sectors since, the local agricultural economy and supporting sectors for the agricultural activities may collapse in a country.

Land–use change is adversely affected to the ecosystem and socioeconomic of the country. Urban development, Deforestation, farming and other human activities have greatly changed the Earth's environment. Those activities are adversely impacted to the ecosystem long-termly. According to the view of Soule (1991) urban development and intensive agriculture have become a major threat to the biodiversity, productivity and health in coastal and inland areas throughout the world.

Land conservation contributes immensely to economic growth and sustainable development in a long term period. However, land use policies must balance private property rights with the public interest.

2.11 Roles of the Impact Assessment of the Development Project

According to the studies of Organization for Economic Cooperation Development (2014) there are two roles to play in impact assessment and it is component of policy or programming cycle in public management.

- Ex ante impact analysis; This is the first part of the impact assessment, it has involved analysis planning activities of and it is done by policymaker's.

- Ex post impact assessment; The evaluation and management practices are widely applied as the second part of the impact assessment and evaluation's goals are considered to extent the policy, how a policy intervention corrects the problem, cover a broader range of issues such as the appropriateness of involvement in design and its unintended consequences and how to use the experience of this intervention to strengthen the intervention.

Also, Jui-lin (2003) mentioned, identification of the potential or actual impacts of the physical development is defined as the impact assessment and it primarily depend on social, economic and environmental factors.

2.12 Impact of Development projects

2.12.1 Economic Impacts

Dlamini (2016) had notified Gross Domestic Product (GDP) and Gross National Product (GNP) are important factors for the national and world economies and construction industry around the world contributes significant portion to improve the economy for each country, also many governments believe that the construction industry plays a strong role in economic development and improving the quality of life of the people.

As per view of Tebaldi (2014) the impact of the economy on the construction industry. This will also directly effect to the other industries such as manufacturing, retail trade warehousing, transportation, real estate, wholesale ,rental and leasing services, construction industry creates direct jobs, income and tax revenue for the state.

2.12.2 Social Impacts:

Guidelines and Principles for Social Impact Assessment (1995) described as a result of development project such as urbanization, highway and reservoir development, development of natural resource or policy change, various social impact can assess by measuring the change in human population and communities relationship and

they suggested list of social variables are (1) Demographic Characteristics;(02) Community and Institutional Structures;(3) Political and Social Resources;(4) Individual and Family Changes and (5) Community Resources.

According to the finding of some authors such as Xiahou et al. (2018) under certain conditions, social impacts of the construction projects should keep social sustainability by analyzing requirements of various stakeholders since, social impacts couldn't evolve into social risks and social conflicts should be minimal between different stakeholders.

2.12.3 Environmental Impact

According to the view of National Environmental Policy Act (NEPA) of 1969, In the United States, Environmental impact assessment is recognized as an important component of environmental planning and decision making.

According to the studies of Ametepey and Anash (2015) the top ten most important environmental impacts have identified. They are as follows: raw materials consumption, noise and vibration generation, vegetation removal, interference with the ecosystems, water consumption, and electricity consumption, loss of edaphic soil, dust generation from machinery, ordinary waste and fuel consumption. Yusof and Iranmanesh (2016) identified significant impact to the environment from these activities on the fast-growing construction.

2.13 Theories

2.13.1 The Growth Pole Theory

Komarovski and Komarovskiy (2013) mentioned the article sets out to assess potential practical applications of the theory to growth poles in the development of local economic development programs and regional planning. Furthermore, the mechanisms leading to the development of the pole are not specified, which reduces the explanatory power of the theory and its applicability to the analysis of land use determinants in this context.

2.13.2 Multi-nuclei Theory

Harris and Ullman (1945) argued that the multi-nucleus model provides a good explanation of land use organization, using multiple nodes to describe how urban land is used. The Central Business District is no longer at the center of the action, but multiple business districts develop to support the outlying areas of the city.

The number of nuclei may vary from city to city, especially the larger the city the more the nuclei and specialization. Once the nucleus has formed other land use developed around them. The growth assumes here is more dramatic, sometimes divergent but more impressionistic as regards its effects on city size and structure.

This theory was focused on certain assumptions such as: cultural and social homogeneity, trade and industry-based economy, private property ownership and economic competition for land, simple rapid and inexpensive transportation in every direction from the city center. It gives a simplified viewpoint and serves pedagogical purposes with respect to urban development dynamics. Nevertheless, the theories provide us with a valuable starting point in the search for an understanding of the mechanism of urban development in developing countries.

2.14 Introduction to Relocation

Humaedi (2016) mentioned if the affected area does not provide the criteria for standards of housing and living standards the proper relocation is the most important option for the beneficiaries. According to Ballesteros & Egana (2012) relocation and housing should be with in the same Local Government Unit (LGU) in same town and off-city relocation is 20–30 km from the original location.

As per the view of Sangasumana (2018) the displacement is a life-changing event, since modern disaster management plans is very important and it should address restoration of lives such as housing construction, establish the livelihood opportunities, rehabilitation, reintegration in the process of resettlement, relocation issues, challenges for seeking durable solutions for relocation issues and community based strategies. Meanwhile Hu, Hoomijer and Sun (2015) mentioned people who

resettled on variety reasons; those are infrastructure development, real estate development, congestion mitigation programs and workplace housing allocation.

Further Hu et al (2105) emphasized on the complex process of displacement and resettlement for mitigate the relocation issues involving residents, government agencies, demolition companies and displaced persons should reach to general consensus. According to Sangasumana (2018) Global Report on Internal Displacement in 2016 represent on the natural disasters such as floods, storms, earthquakes, volcanic eruptions, wildfires, landslides and extreme temperatures 19.2 million people were displaced in the 113 countries across all regions of the world in 2015.

2.15 Reasons for Relocation

According to the view of Jha, Tignath & Rathore (2013) highlighted on the large size of power generations projects such as large dams or ultra-mega power projects, there is a potential risk to change the environmental and socio-economic background hugely on the movement of large volume of the communities from one place to other.

Vijekumara (2015) mentioned landslide resettlement is important in both local and global context and require different types resettlement projects on the nature and complexity of landslides and it is considered as a minor type of disaster not a common occurrence in Sri Lanka and it was mentioned average number of landslides per year did not exceed 50 until the year 2002.

Meanwhile Vijekumara (2015) said if the house is lost on the disaster strikes, important decision should take during the disaster recovery phase to relocate the people in same area. According to the view of Sangasumana (2018) in the colonial era large number of communities were displaced on the major reservoir projects and recently lot of people were displaced due to the tsunami victims and war between the Sinhalese and the Tamils lasted decades in Sri Lanka.

2.16 Issues of Relocation

Issues of the resettled people are shown in the Table 2.1

Table 2.1 Issues of Relocation

No	Issues	1	2	3	4	5	6
1	Lack of evidence and data institutions when select the re-settler's for the relocation process	x					
2	Lack of evidence and data institutions when select the re-settler's for the relocation process	x					
3	Authorized agencies were only interested in the pre-rehabilitation period and they did not involve to the social and economic situation after resettlement	x					
4	Poor resettlement planning				x		
5	Poor designing				x		
6	Inadequate finance capacity				x		
7	Incomplete implementing planning				x		
8	Illegal settlements				x		
9	Homelessness		x				
10	Social marginalization		x				
11	Lack of access to public resource		x				
12	Social stigma		x				
13	Less government attention find the durable solutions during the recovery phase and take the long time to implement the policies on the resettlement process			x			
14	The expected project objectives were not realized due to poor participation of the people during the period of project planning and the lack of communication between the agencies and the communities.			x			
15	Issues of relocation policies implemented by Sri Lankan Government (SLG) for longtime.			x			
16	Most likely, the unequal distribution of donations			x			
17	Less funding for children's schooling.			x			
18	Disease transmission			x			
19	There was a major lack of space in the temporary shelters for a big number of families.			x			
20	The selection process was a major issue the delay in locating viable land blocks for relocation sites			x			

21	Inadequate basic information					x	
22	Lack of resettlement planning					x	
23	Lack of involvement and consultation of the affected people					x	
24	Inadequate financial capacity on time compensation payments.					x	
25	Insufficient modern technical capacity, institutional less involvement and poor monitoring program system etc					x	
26	Unequal finance distribution among the people					x	
27	In terms of accessing common resources like as roads, water canals, springs, natural vegetation and so on several conflicts had arisen between the newly moved people and the host community					x	
28	Decentralization of the responsibilities among the various institutions due to the long delay in project implementation.					x	
29	Waste disposal problems	x					
30	Lack of sewerage facilities	x					
31	Government was also not properly held accountable to the affected families regarding livelihood restoration as prescribed in the related regulations						x
32	Lack of effective participation, including stakeholders and the affected families, worsened the livelihoods of affected families in the new villages.						x
References [1] Fernanado (2017);[2]Silva (2018);[3] Sangasumana (2018); [4]Fernando (as cited by Smith,2009);[5]Sangasumana (as cited Zaman,2002) [6] Sokphea (2015)							

Sangasumana (as cited Badriet al., 2006) reported well-planned and proper process of relocation can generate a positive long-term strategy for the development.

According to the view of Fernando (2017) there are few major aspects to success the relocation project, those investigate the adequate time frame for relocation process, proper resources planning, implementation planning, long term and short term progress monitoring system, corporate with relevant communities cope with various risk and complete the relocation project with agreed time frame.

Fernando (2017) reported main difficulties faced by the officers under relocation activities.

- Lack of evidence and data institutions when select the re-settlers for the relocation process.
- Authorized agencies were only interested in the pre-rehabilitation period and they did not involve for social economic issues after resettlement.

Fernando (as cited by Smith, 2009) stated reasons for failure resettlement, those are poor resettlement planning, poor designing , inadequate finance capacity, incomplete implementing planning and illegal settlements such as near canal banks or low lying lands, which are always exposed to natural hazards like floods .

According to the view of Jha et al. (2013) on the less enthusiastic about proper environmental friendly designing and socio-economic rehabilitation planning before displaced the people they had to fight with environment and as a result they were relocated in barren and unfertile lands.

Silva (2018) described negative effect of the relocation those are Homelessness, social marginalization, lack of access to public resources, social stigma and children were suffered impoverishments of economic, social and cultural.

Sangasumana (2018) further described issue of the relocation as below

- Less government attention find the durable solutions during the recovery phase and take the long time to implement the policies on the resettlement process.
- The expected project objectives were not realized due to a lack of citizen involvement during the period of project planning and a lack of communication between the authorities and the general public.
- Issues of resettlement policies launched by Sri Lankan Government (SLG) for longtime.
- Most likely, the unequal distribution of donations.
- Less funding for children's schooling.
- Disease transmission.

- There was a major lack of space in the temporary shelters for a big number of families.
- The selection process was a major issue the delay in locating viable land blocks for relocation sites.

Sangasumana (as cited Zaman 2002) pointed out factors for failure relocation those are

- Inadequate basic information
- Lack of resettlement programming.
- Poor involvement and consultation of the resettled communities.
- Inadequate financial capacity on time compensation payments.
- Insufficient modern technical capacity, institutional less involvement and poor monitoring program system etc.
- Unequal finance distribution among the resettled communities.
- Arising of conflicts between the newly moved people and the host community such as things of roads, water canals, springs and natural vegetation.
- Decentralization of the responsibilities among the various institutions due to the long delay in project implementation.

Meanwhile Fernando (2017) reported waste disposal problems was the major problems as a result of poor planning and poor sewerage facilities, clogged drains and succumbed to regular flooding and eventual displacement of people were other related problems.

Further, Fernanado (2017) highlighted beneficiaries were reluctant to move the new relocation places from their original places, but they had not any choice other than to succumb new locations and they agreed to move under various guarantees receiving from government politicians, then government investigated beneficiaries complaints if they have any difficulties.

Sokphea (2015) reported besides the transparency issue, the government was also not properly held accountable to the affected families regarding livelihood restoration as prescribed in the related regulations and lack of effective participation,

including stakeholders and the affected families, worsened the livelihoods of affected families in the new villages.

2.17 Facilities to the Relocation

Facilities for the Resettled people are shown in the table 2.2

Table 2.2 Facilities to the Relocation

No	Facilities	1	2	3	4	5	6
1	People who have lost properties and assets for make a living such as houses, infrastructure facilities, livelihood, firstly government should provide advices and enables people to become self-sufficient, rather than needing to rely on continued relief aid.	x					
2	Provide adequate funding for the before relocation it will contribute to improve the public infrastructure facilities and services of the community		x				
3	Local governments should provide required funds before relocate the people		x				
4	Safety, security and livelihoods of the beneficiaries		x				
5	Constructing houses should be acceptable manner, proper houses design with basic facilities, good condition of the relocation sites, , livelihood recovery , providing of social infrastructure services, re-modeling of neighborhood relationship, restoration of culture and empowerment of the community.		x				
6	Donated houses should be built be very quickly within short time period to transfer the displaced people.		x				
7	Better Infrastructure facilities (entrance roads, street lighting system, community centers and places of worship places etc.), and also other required facilities. (Drainage channels, bridges, transportation system, garbage disposal system, postal services.		x				
8	Planning strategies broadly aim to the improvement of Social, physical infrastructure, school and health services to meet expanded needs of beneficiaries.			x			
9	The mental satisfaction of the people and leisure ,neighborhood the living environment, schools, family, health facilities are directly influenced happiness to the individual residents				x		
10	Develop the other educational assistance included teacher training, merit- and need-based scholarships,					x	

	sports activities, school libraries and mobile libraries.						
11	The education program serves resettled households 'children and host village children					x	
References [1] Sina, Richards, Wilkinson, Regan and Potangaroa (As cited by Ahmed ,2011) ;[2] Fernanado (2017);[3] Sangasumana (as cited in Smith, 2001 [4] Sina et al. (as cited in Norris, Stevens, Pfefferbaum,Wyche & Pfefferbaum, 2008) ;[5] Sokphea (2015)							

Sina, Richards, Wilkinson, Regan and Potangaroa (as cited by Ahmed, 2011) addressed people who have lost assets and resources for make a living such as houses, infrastructure facilities and livelihood, the government should be consulted first as it will enable people to become self-reliant instead of relying on constant subsidies.

Meanwhile Fernanado (2017) said by providing adequate funding for the before resettle it will contribute to improve the public infrastructure facilities and services of the community and local governments should provide required funds before relocate the people and poor resettlement process has a negative impact to the relocated community and mentioned characteristics for the relocation sites those are

- Security, safety and livelihoods of the beneficiaries.
- Constructing houses should be acceptable manner, proper houses design with basic facilities, good condition of the resettled sites, proper legal transfer, livelihood recovery , providing of social infrastructure services, re-modeling of neighborhood relationship, restoration of culture and empowerment of the community.
- Donated houses should be built be very quickly within short time period to transfer the displaced people from transitory shelters to permanent houses.
- Better Infrastructure facilities (entrance roads, street lighting system, community centres and places of worship places etc.), and also other required facilities. (Drainage channels, Bridges, Transportation, Garbage disposal system, Postal services and Play grounds etc.).

Sangasumana (as cited in Smith, 2001) reported the resettlement process should be geared towards to the development of a country and planning strategies broadly

target to the social and physical infrastructure improvement , health and school services and beneficiaries should meet expanded needs.

Sina et al. (as cited in Norris, Stevens, Wyche and Pfefferbaum, 2008) stated quality of the life often depend on the mental satisfaction of the people and leisure ,neighborhood the living environment, schools, family, health facilities are directly influenced happiness to the individual residents.

Deshpande, Munshi, and Derekar, 2017 introduced the Poor basic facilities it can listed as below.

- Inadequate infrastructure, such as a lack of schools, power, public roads and frequent power outages.
- Raids of wildlife on crops.
- Small land areas.
- Very low yield areas and uncomfortable health and education system for the children.

In addition, Sokphea (2015) mentioned remedies for the above issues those are

- Additional teachers were deployed from the provincial center and provided accommodation with necessary facilities and develop the school facilities and maintained the regularly.
- Develop the other educational assistance included teacher training, merit- and need-based scholarships, sports activities, school libraries and mobile libraries.
- The education program serves resettled households' children and host villages children.

2.18 Importance of Livelihood

Costanza, Fisher, Ali, Beer, Bond, Boumans and Farely (2007) argued livelihood of the beneficiaries is key step to measure the effectiveness of the recovered life in the relocated people and it also interpreted as a way of life that will lead to the sustainable building of community resilience and livelihoods.

According to the view of Sina, et al. (2019) government institutions and aid agencies need to plan enhance the post disaster livelihood of the people or they should plan before displace the people about relocation to improve the communities life on displacement.

Sina et al. (as cited in Frankenberger et al., 2000) mentioned livelihood resources as physical and social capital (monetary) properties, as well as technological and in-kind employment assistance that can be used for livelihood development.

Frankenberger, Drinkwater and Maxwell (2000) mentioned all activities in human life are based on their livelihood, mainly included easy way to adequate food, health facilities, houses, minimum levels of income, education facilities, safety and security.

Fernando (2017) mentioned moreover, most of the dwellers were temporary workers and they received inadequate income to cover their expenses, as well as there was not proper planning strategies to raise the households income.

Humaedi (2016) stated reform of houses also in comfortable environment is one important feature in the livelihood program and it will pay attention progress of the housing reconstruction. Sina, Richards, Wilkinson, and Potangaroa (as cited in Régnier, Neri, Scuteri, and Miniati, 2008) mentioned sustainable development the restoration of their livelihoods can be accelerated by resuming the previous economic and social activities of the communities.

Sokphea. (2015) further described low incomes were due to a low level of education, as they had no ability to survive and to restore their livelihoods in the new villages and unfamiliar living environment, coupled with a new livelihood based on urban resources rather than natural resources and agriculture, resulted in adverse impacts on these families despite an increase in income.

Humidy (2016) pointed out communities are reluctant move to a new relocation places from their former places on the strong connection about ethics, religion, language, social status and cultural aspects in the former areas.

2.19 Involvement party of Relocation Process

Involvement parties for the Resettlement Process is shown in the Table 2.3

Table 2.3 Involvement party of Relocation Process

No	Parties	1	2	3	4	5	6
1	Governments.	x					
2	International community.	x					
3	Emergency management.	x					
4	Resettled communities		x				
5	Provincial Councils and Local Authorities		x				
6	Grama Niladhari		x				

Silva (2018) explained following institutions should be attend to relocation process.

- Governments.
- International community.
- Emergency management.

Further Fernanado (2017) explained following communities also should be attend to relocation process.

- Resettled communities.
- Provincial Councils and Local Authorities.
- Grama Niladhari officers (Village level Administrative Officer).
- Development Officers.
- Samurdhi Officers etc.

Hu, et al (2105) explained basically compensation process for the lost lands depend on the various type of land ownership, which is implemented by housing assessment agencies and it is selected by jointly displaced communities and local government and payment is done by per-square-meter basis for demolished houses and rate is decided by local government for per-square-meter.

2.20 Health and safety effects for the relocated people

As per view of Pers, Kibele and Mulder (2017) on the immediate displacement, communities can be faced various health problems, thus making their homes same as at older age care institution and making comfortable residences are the strategies to resolve this issues.

Further, Sandel and Wright (2006) reported people problems such as overcrowding, dampness and condensation are directly affected great stress to the communities and there should be proper arrangement to resolve these health issues.

Torres and Nowson (2007) reported on the uncomfortable environment such as painful noises, rudeness neighbors or antisocial behavior can become accustomed to unhealthy lifestyles such as over-eating or unhealthy eating or increased smoking and drinking.

Meanwhile Sokphea (2015) expressed in accordance with national health center standards, the resettlement project supported the health center's equipment with many medical instruments and facilities, including an ambulance and also explained key person trainings in each village were conducted, as were events to raise public awareness of dengue fever, malaria, public sanitation and vaccination.

Meanwhile, Ryman, Erisman, Darvey, Osborne, Swartsenburg and Syurina (2018) highlighted necessity of policy making and reanalysis regarding with health facilities of resettled people. Ade and Mason (2014) mentioned health behaviors such as physical and mental health issues have rarely studied as the result in relocation of the people.

Meanwhile Sanbonmatsu, et al (2012) stated as a result of relocation, new dwellers started more groceries reducing the cost of healthy foods and reduced the alcohol outlets and number of stores that sell tobacco, since their health condition was improved significantly level.

2.21 Summery

The chapter brings about five areas, those are

- Development project
- Irrigation development project
- Yan Oya Reservoir Development project
- Impact of Development Project
- Relocation process

Under development project discuss characteristics of development project what has happened for the development project developing countries.

Water resource-based projects are one of the major development projects under Irrigation Department of Sri Lanka. The Mahaweli Development Project (MDP) is defined as largest irrigated agricultural development in Sri Lanka and Irrigation Programme was formally launched in the late 1960 and subsequently accelerated in the late 1970s by a newly elected government.

YORDP is the largest irrigation project in the North Central Province and main purposes of it improve the drinking water facilities in this area, provide the drinking water and irrigation facilities for Trincomalee district and extend the Irrigation facilities to Anuradhapura for both seasons and also this project provide positive and negative impacts for the resettled communities.

Economic, Social and Environmental impacts are discussed this chapter on the Development Projects. Finally bring Reasons for Relocation, Issues of Relocation Facilities to the Relocation, and Involvement party of Relocation Process, Health and safety effects for the relocated people.

CHAPTER 03**RESEARCH METHODOLOGY**

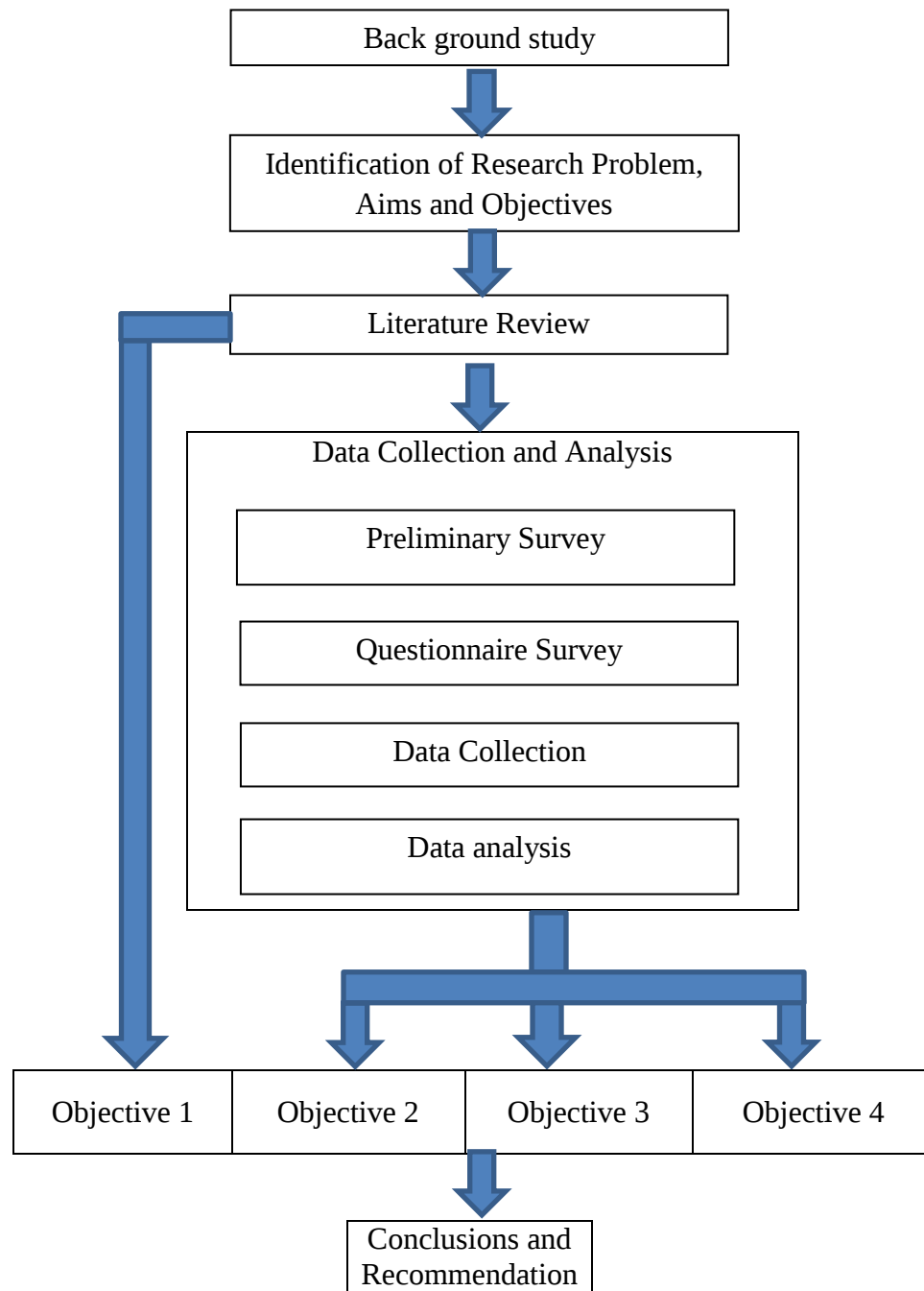
3.1 Introduction

Theoretical and systematic analysis are defined as the research methodology applied to the area of study. Theoretical analysis of structure is associated with methods, principles and a branch of knowledge. It shows concepts such as theoretical model, quantitative or qualitative techniques and paradigm. Under this research, its focus on examining the problems of Wahalkada, Kajuwatta, Malporuwa and Omarakada areas resettled communities on YORDP. Research methodology is described in this section and to be adopted details for the study. It reveals data collection and sampling methods as well as methods of proposed data analysis of the resettled communities in Wahalkada, Kajuwatta, Malporuwa and Omarakada relocated areas.

3.2 Research Design

The research plan has designed to express the research problems as definitely as possible. The research questions are ensured very shorty and accurately. Answers also easily and accurately to meet the research objectives an acceptable manner. It outlines was executed with the minimum complications.

A research design based on the framework of field study and it is used to achieve the research goals and make the conceptual framework operational. That means this research is based on type of qualitative and quantitative methods in which information is obtained through questionnaire survey directly from person and social population groups related to the study.

**Figure 3.1 Research process**

3.3 Nature and Source of Data

3.3.1 Nature of Data

According to the view of (SERAC (2007) nature of data there are two types of data those are;

Continuous Data: These data are changed between two given values. In computer application, they are referred as real numbers. The continuous data is used for this research include monthly income, respondent age etc.

Categorical Data: These data are variable and it is limited, and usually integer number of possible values. e.g gender, marital status and occupation.

3.4 Data Collection

Addition to the based on the findings of the literature survey, preliminary survey was conducted with development officers of the project. They appointed by the Irrigation Department to identify the problems of the resettled communities. After interviewed first five development officers, new problems were not identified. Then preliminary survey was stopped. Then based on the literature review and preliminary survey findings, questionnaires survey guide line was prepared. Subsequently questionnaires were distributed among the resettled communities in Malporuwa, Kajuwatta, Omarakda and Wahalkada areas in Anuradhapura district.

3.4.1 Target Population

Malporuwa, Kajuwatta, Omarakda and Wahalkada in Anuradhapura districts resettled communities were considered as the target population for the study and who have been facing problems on the Yan Oya Reservoir Project.

3.4.2 Sample Selection

The total number of people living in a geographical area over a given time period was taken as the study target population. The population targeted on this research was affected due to YORDP since their properties were acquired for the project.

3.4.3 Sample Size

The sample size is important in reflecting the characteristics of the communities and in order to apply parametric statistics, the size of the sample must be sufficiently large (Taylor, 2010). As thumb rule, it should be at least 30. Considering all these factors and time frame, the sample size of this research was selected as 166 beneficiaries from the Malporuwa, Kajuwatta, Omarakada and Wahalkada resettlement areas. Tables 3.2 and 3.3 show the sample profile.

Table 3.1 Number of households in each relocation area

Communities	Number of households
Malporuwa	69
Kajuwatta	59
Omarakada	27
Wahalkada	29

Table 3.2 Number of households Vs Number of respondents in each relocation area

Communities	Number of households	Number of respondents
Malporuwa	69	61
Kajuwatta	59	53
Omarakada	27	25
Wahalkada	29	27

Questionnaire design

Resettled communities problems were developed based on the preliminary survey findings and the comprehensive literature review of the YORDP in Sri Lanka. Then, the questionnaire was designed to get the resettled communities' perception and expectations from the project.

Mainly, the questionnaire had four sections (A, B, C and D) on resettled communities problems in YORDP.

Section A: Demographic characteristics

This section is applied to gather information of the respondents. According to the questions asked socioeconomic characteristics of the resettled communities' Gender, respondent age group, civil status, occupation, average monthly income, highest Educational Qualifications information are considered for this section.

Section B: Understanding and perception of the project

Under this section resettled communities understanding and perception information was collected due to the YORDP. Mainly virtuous and unvirtuous factors are discussed for the villages in this section as per view of the beneficiaries on YORDP.

Section C: Environmental and socio economic issues.

The section C was designed to gather environmental and socioeconomic problems of the resettled communities due to the YORDP. These sets of questions bring the feedback from HH what are the problems they are facing in the relocation area on YORDP. The questionnaires have used 5 points as shown in Table 3.4;

Table 3.3 Scaled applied to identify impact of resettled communities problems.

Scale	Level of the Impact	Impact Zone
1	Very Low impact	Blue
2	Low impact	Orange
3	Medium impact	Green
4	High impact	Yellow
5	Very High impact	Red

Relative index analysis was chosen to rank the criteria in the study. Following formula was applied to determine the relative index values.

$$RII = \frac{\sum W}{A \times N}$$

W -is the weighting as assigned by each respondent on a scale of one to five with one implying the least and five the highest.

A- is the highest weight

N -is the total number of the sample.

Based on the ranking (R) of relative indices (RI), the weighted average of the two groups will be determined.

According to the Akadiri (2011) five important levels are transformed from RI values:

- Very High (VH) ($0.8 \leq RI \leq 1$),
- High (H) ($0.6 \leq RI \leq 0.8$)
- Medium (M) ($0.4 \leq RI \leq 0.6$)
- Low (L) ($0.2 \leq RI \leq 0.4$)
- Very Low (VL) ($0 \leq RI \leq 0.2$).

The Scale used to identify Problems of the resettled communities is shown in Tables 3.5 and 3.6;

Table 3.4 Scale that used to identify impact level of the resettled communities based on magnitude of relative indices

Relative Indices	Impact level	Impact zone
$(0.8 \leq RI \leq 1)$	Very Highly impacted problems for resettled communities	Red
$(0.6 \leq RI \leq 0.8)$	Highly impacted problems for resettled communities	Yellow
$(0.4 \leq RI \leq 0.6)$	Medium impacted problems for resettled communities	Green
$(0.2 \leq RI \leq 0.4)$	Low impacted problems for resettled communities.	Orange
$(0 \leq RI \leq 0.2)$.	Very Low impacted problems for resettled communities	Blue

Table 3.5 Zones Vs Impact of resettled communities' problems

Red zone	The Impact was very high in this zone, there should be top priorities resolve this problems.
Yellow zone	The Impact high in this zone, there should be top priorities resolve this problems.
Green zone	The Impact was medium effect this zone hence make the reasonable steps to resolve this problems.
Blue zone	This zone impact can be ignored by resettled communities.
Orange zone	This zone impact can be ignored by resettled communities.

Conducting questionnaire survey

The final questionnaire was administered on the resettled communities of the Malporuwa Kajuwatta, Omarakada and Wahalkada areas and completed responses were collected.

3.5 Summary

The research method adopted to fulfill the aim and objectives of the research study. According to the literature survey, resettled communities problems and mitigation measures were studied due to development projects. Identified issues from the literature survey further discussed resettled communities at YORDP.

The research methodology was the survey approach. Preliminary survey was used to collect the data and the questionnaire survey. Cochran's formula was used for select the sample size. Relative Importance Index method was used to recognize the magnitude of the problems of the resettled communities on YORDP.

CHAPTER 04**DATA ANALYSIS AND INTERPRETATION**

4.1 Introduction

This chapter is focused to analyzing and interpreting the data, gathered during the research in relation to the objectives stated in this study. In this chapter presents the collected data is presented in tables and figures.

There are four main sections in this chapter. First section is summery of the findings of the preliminary survey. The respondent information was analyzed in questionnaire survey in the second section. Analyzing of each problem of the resettled communities using Relative Importance Index method is included next section. The Fourth section interprets of the analyzed data using tables and charts.

4.1.1 Project Description

The Yan Oya reservoir project includes constructing an earth dam across Yan Oya, upstream of the existing Yan Oya diversion weir at Pamburugaswewa. This reservoir was set up with a capacity of 169 MCM. The main dam is situated between Yakini Kanda and Weherabendi Kanda and it is 2,350 m long and situated 30 km upstream of the current Yan Oya outfall at Pulmodai. Four saddle dams had been constructed in addition to the main dam to complete the proposed YORDP at the chosen locations. Total length of these four saddle dams are 3,594 meters. Therefore, total length of the proposed dams is 5,944 m (including both main and saddle dams).

4.1.2 Project Location

The project is situated in district of the Anuradhapura in north-central province of Sri Lanka, about 300 km from the capital city of Sri Lanka, Colombo. The proposed dam is located about 70 km downstream from Huruluwewa tank. Its geographic coordinates are: $7^{\circ}55'00'' \sim 8^{\circ}55'00''\text{NL}$, $80^{\circ}41'27'' \sim 81^{\circ}2'10''$ at EL. The expected irrigated area of the project is 6346 ha.

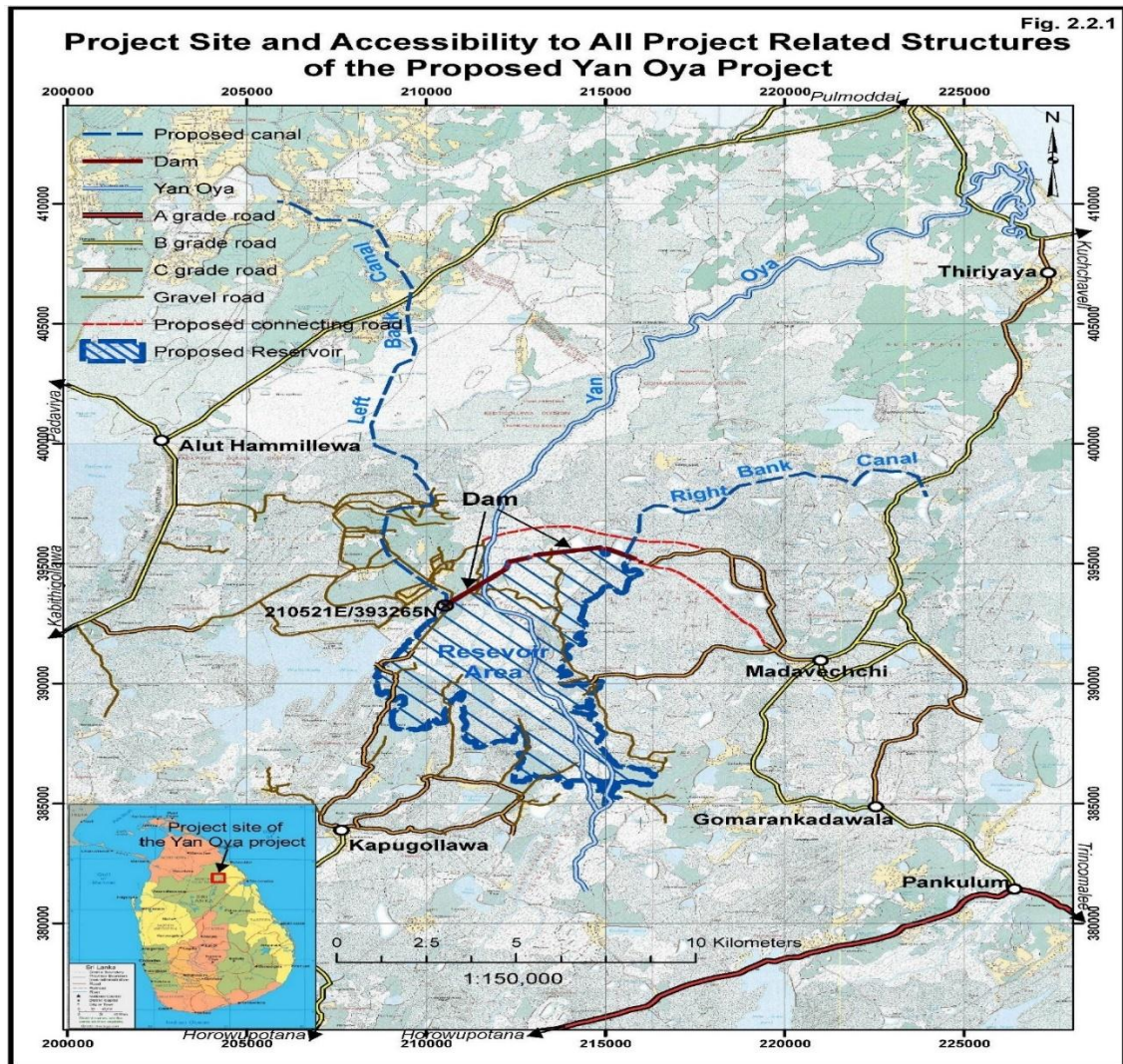


Figure 4.1 Project site and accessibility

4.2 Demographic Profile of the Affected Persons

4.2.1 Gender Distribution of respondents in each resettled communities

The study revealed gender distribution is shown in Table 4.1 and Figure 4.2

Table 4.1 Distribution of gender

Villages	Male	Female
Malporuwa	48%	52%
Kajuwatta	41%	59%
Omarakada	53%	47%
Wahalkada	42%	58%

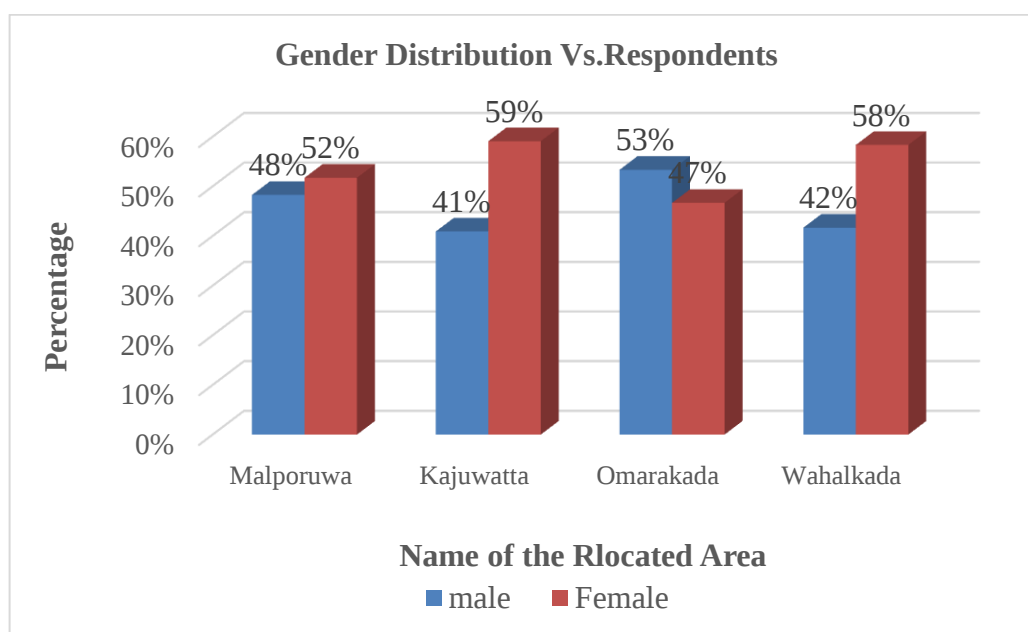


Figure 4.2 Gender distribution

According to the gender distribution above, the chart shows that the 46% of all respondents were male and 54% were female. It reveals predominant domination is Female gender in the sample.

4.2.2 Age Distribution of respondent in study area

The study presented age distribution is shown in Table 4.2 and Figure 4.3

Table 4.2 Details of age distribution of the resettled communities

Years	Percentage
20-40 Years	39%
41-60 Years	48%
61-80 Years	9%
81 or above	4%

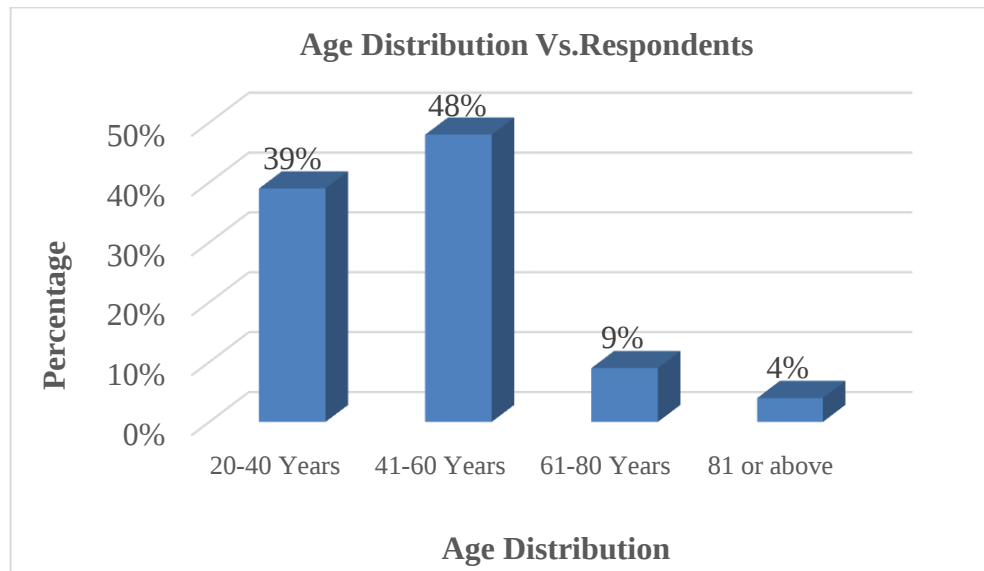


Figure 4.3 Age distribution of the resettled communities

This revealed that there is a predominant domination age distribution is 41-60 years of the sample.

4.2.3 Occupational Status of the resettled communities

Table 4.3 and Figure 4.4 show the details occupational status of the resettled communities.

Table 4.3 Details occupational status of the resettled communities

Occupation	Percentage
Farming	82%
Trading	6%
Craftsmanship	11%
Unemployed	1%

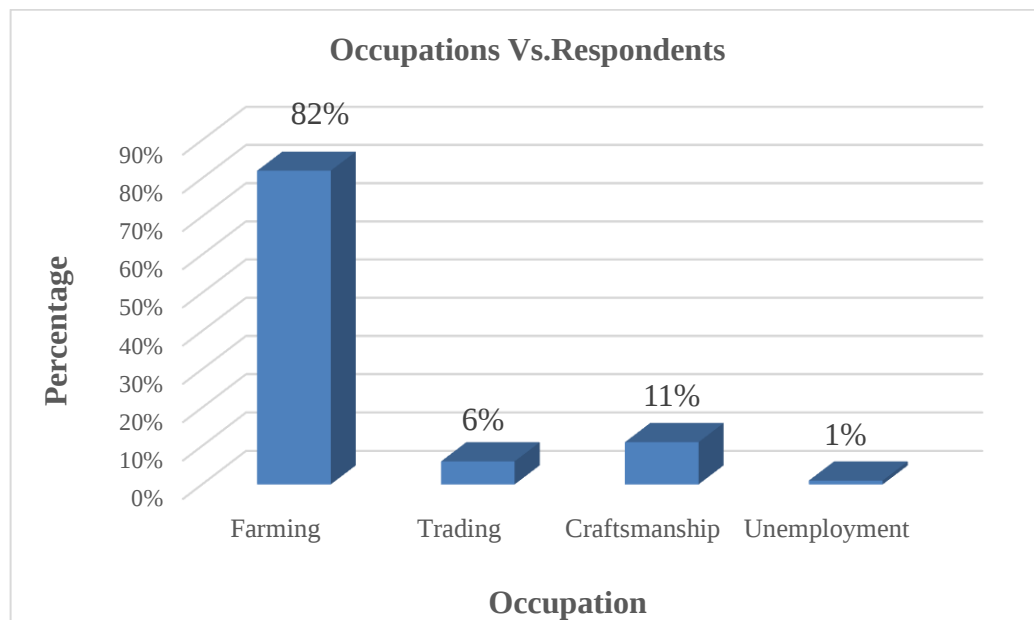


Figure 4.4 Occupation conditions of the resettled communities

Resettled communities economy is based on land and water. The survey reveals 82% of the respondent's income generating activity is farming in this area.

4.2.4 Monthly Income of Resettled communities

Table 4.4 and Figure 4.5 show the details of monthly income of the resettled communities

Table 4.4 Details of monthly income

Income	Percentage
Rs 21,000-25,000	23%
Rs 26,000-30,000	54%
Rs 31,000-35,000	19%
Rs 36,000 or above	4%

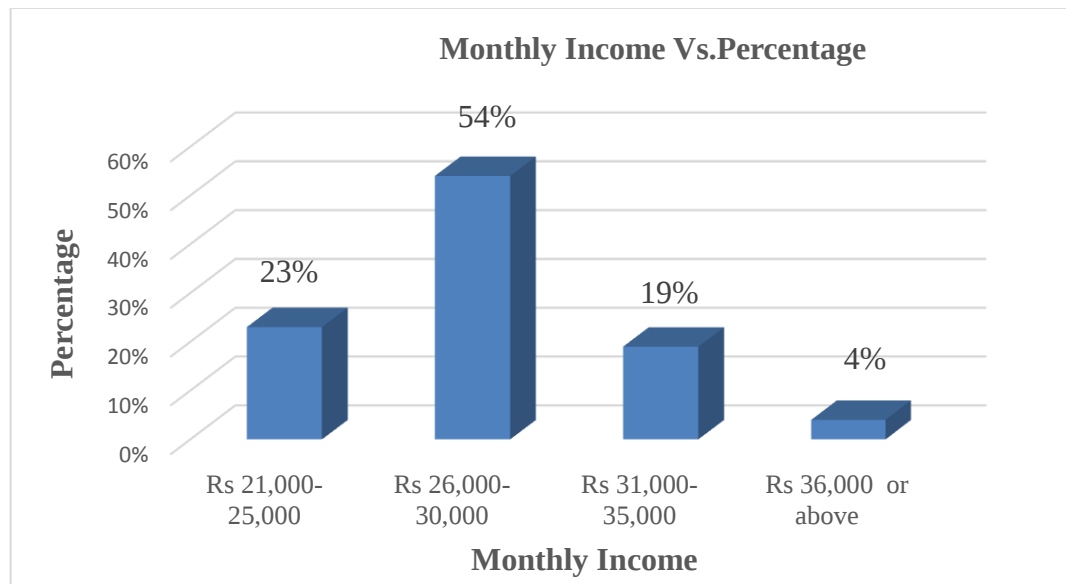


Figure 4.5 Monthly income distribution

Crop farming, Trading and Crafting are the main income generating activities of these villagers. According to chart most of the resettled communities' income is Rs 26,000-30,000

4.2.5 Highest Educational Qualification

Table 4.5 and Figure 4.6 show Highest Educational Qualifications of the resettled communities.

Table 4.5 Education level of the resettled communities

Highest Educational Level	Percentage
Primary school	37%
Secondary school	58%
Vocational/Technical	4%
University	2%

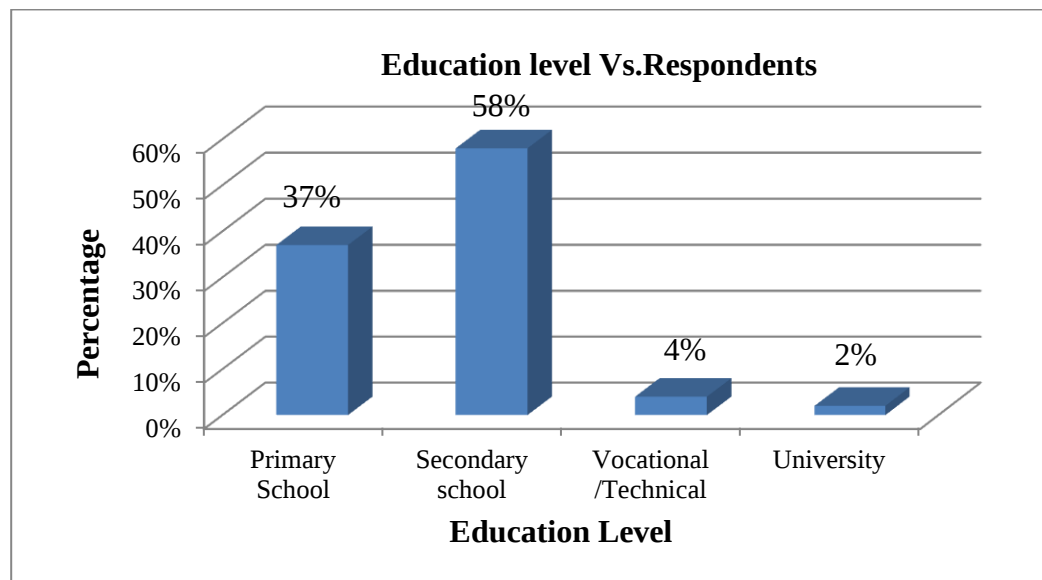


Figure 4.6 Education level of the resettled communities

Out of the 166 resettled communities sampled in the study area, 58% of the resettled communities education level is grade 5-11 that means they have studied up to secondary school level.

4.3 Resettled Communities' Expectations and perceptions from Irrigation Development Projects

This information is intended to identify when and how the resettled communities became aware of the Irrigation Development Project and its expectations and results. The data was collected from standardized questionnaires.

4.3.1 Knowledge about Irrigation Development Project

Table 4.6 and Figure 4.7 are shown communication methods heard about Irrigation Development Project.

Table 4.6 Communication methods heard about Irrigation Development project

Media	Percentage
Television	36%
Radio	39%
Friend or Relative	18%
Newspaper	7%

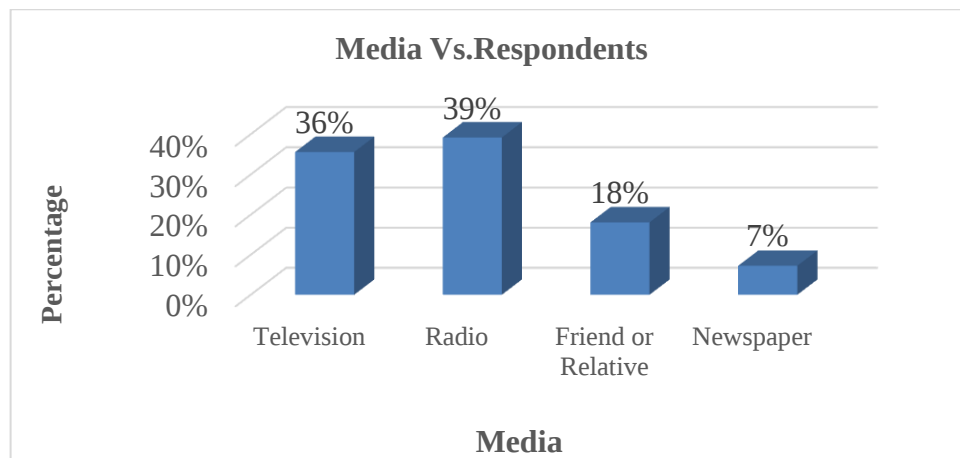


Figure 4.7 Communication methods knowledge about Irrigation project

It was shown that 64% of the resettled communities understand the idea or concept behind an IDP; this is due to the fact that there is a high rate of literature in the communities while 36% do not know the meaning of an IDP. The Majority of the

respondents (39.0%) knew about IDP from the Radio and 7% lowest resettled communities got the information form Newspapers.

4.3.2 Knowledge about the YORDP

Table 4.7 and Figure 4.8 are shown construction phases knew about Yan Oya Reservoir Development Project.

Table 4.7 Construction phases knew about Yan Oya Reservoir Development Project

Construction Phases	Percentage
Before construction of YORDP	78%
During construction of YORDP	19%
After construction of YORDP	3%

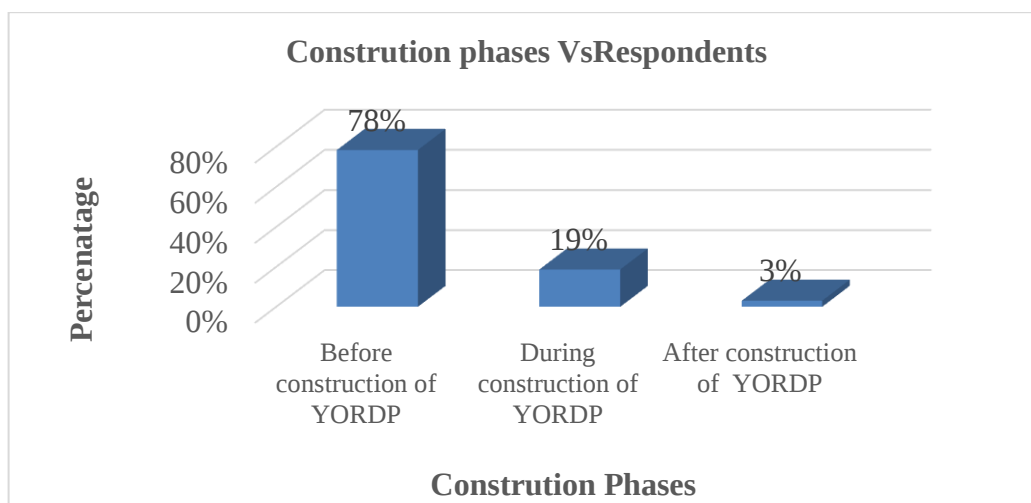


Figure 4.8 Constriction phases of knowledge about irrigation development project

The questionnaire survey revealed that more than half, 78% of the villagers knew about the YORDP before the construction of the project.

The sources of information about YORDP is shown Table 4.8 and Figure 4.9

Table 4.8 Information sources about Yan Oya Reservoir Development project

Source of Information	Percentage
Government of Sri Lanka	54%
Representative of the Irrigation Officer	27%
Political Leader	15%
Other specify	5%

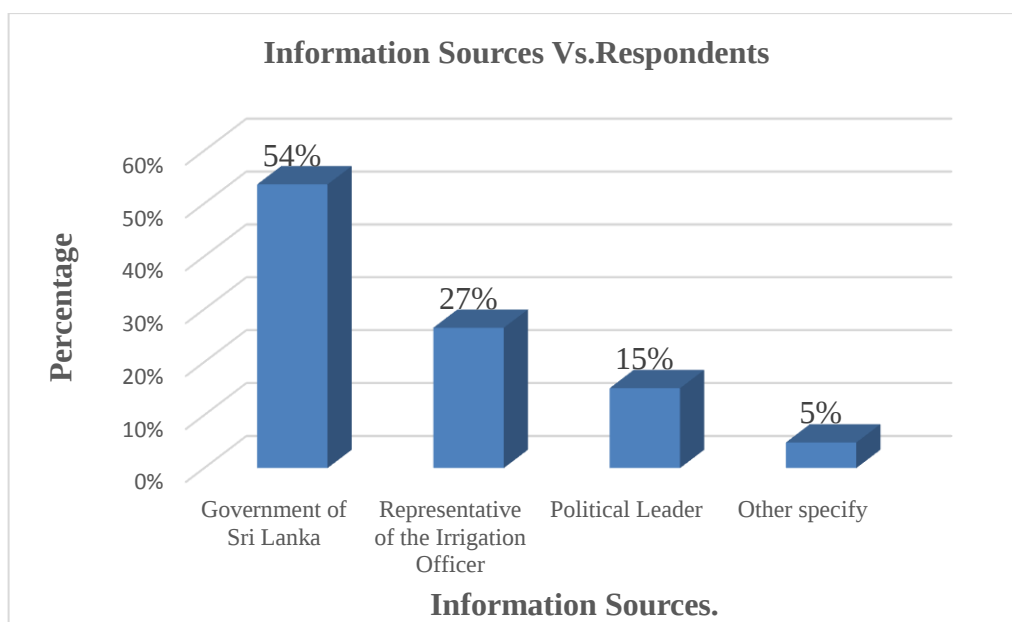


Figure 4.9 Information source about Yan Oya Reservoir Project

The questionnaire survey revealed that more than half, 54% of the villagers knew about the YORDP form Government of Sri Lanka and 27% of the peoples knew about the YORD form Representative of the Irrigation officer.

4.3.3 Expectation from the project

Table 4.9 and Figure 4.10 show Expectations of the resettled communities form the YORDP.

Table 4.9 Resettled communities Expectations

Expectations from the project	Percentage
Job creation	27%
Infrastructural improvement	16%
Increase the Land value	48%
Improvement of Environmental quality	9%

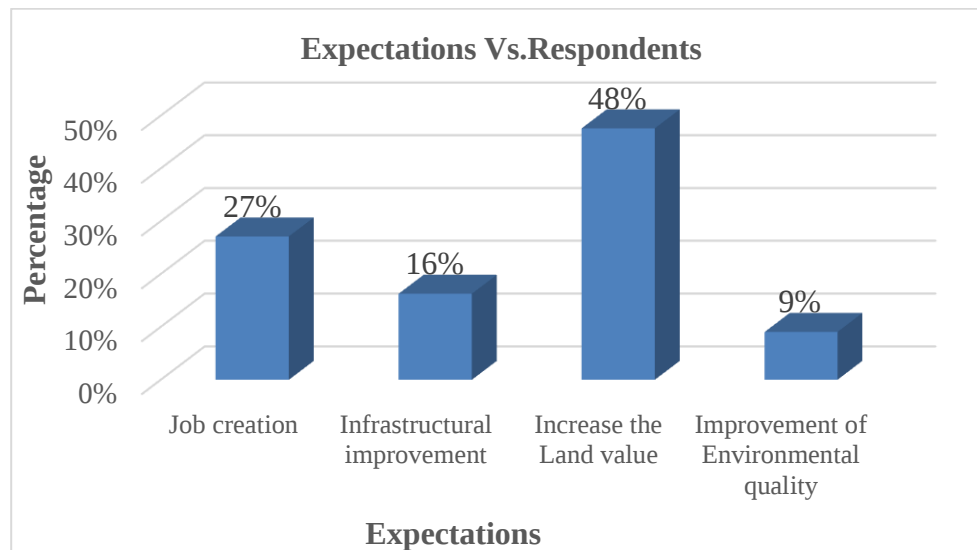


Figure 4.10 Expectation of the resettled communities

This data was gathered both from questionnaires and an interview. The questionnaire survey revealed the expectation of the resettled communities. Those are Job creation, Infrastructural improvement, Increase value of the land and Improvement of environmental quality.

4.3.4 Level of satisfaction for compensation

According to the Table 4.10 and Figure 4.11 show satisfaction level of the resettled communities received compensation.

Table 4.10 Satisfaction level of compensation

Satisfaction level of Compensation	Percentage
Very highly satisfied	2%
Very satisfied	4%
Satisfied	27%
Neutral	7%
Not satisfied	60%

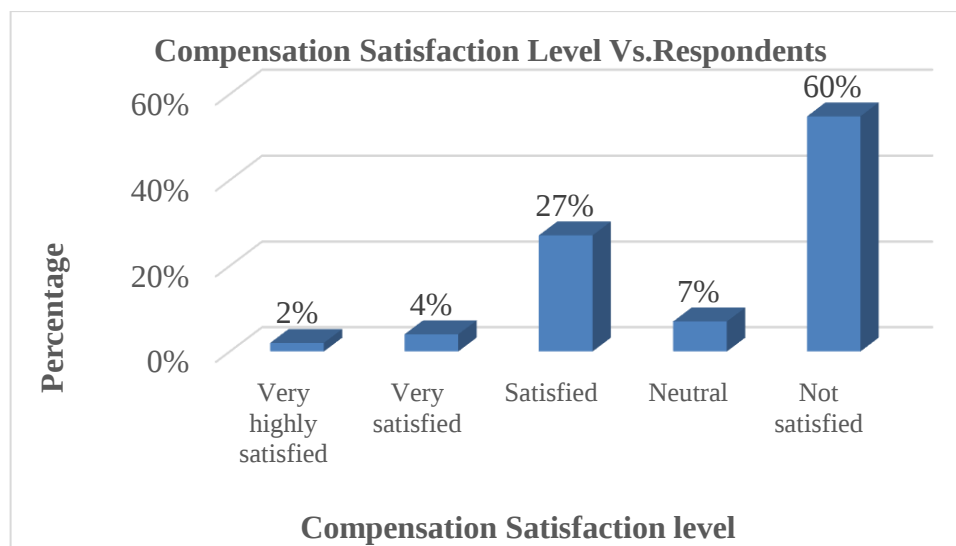


Figure 4.11 Satisfaction level of the compensation

More than half of the resettled communities which is 60% stated they were not satisfy about received compensation for their loosed properties and compensation was not got on time due to the YORDP.

4.6 Environmental and socio economics impacts assessments

4.6.1 Risky season of floods

Table 4.11 and Figure 4.12 show, results of a questionnaire study to determine which season can be flooded in the resettlement zones show

Table 4.11 Relative indices for which season can be floods after construction

No	Risky season of floods	Relative Indices
15.a	Land preparation season	0.388
15.b	Fertilization season (first stage of paddy cultivation)	0.395
15.c	At the time paddy plants (second stage of paddy cultivation)	0.741
15.d	Harvest picking season	0.843
15.e	Harvest selling season	0.794

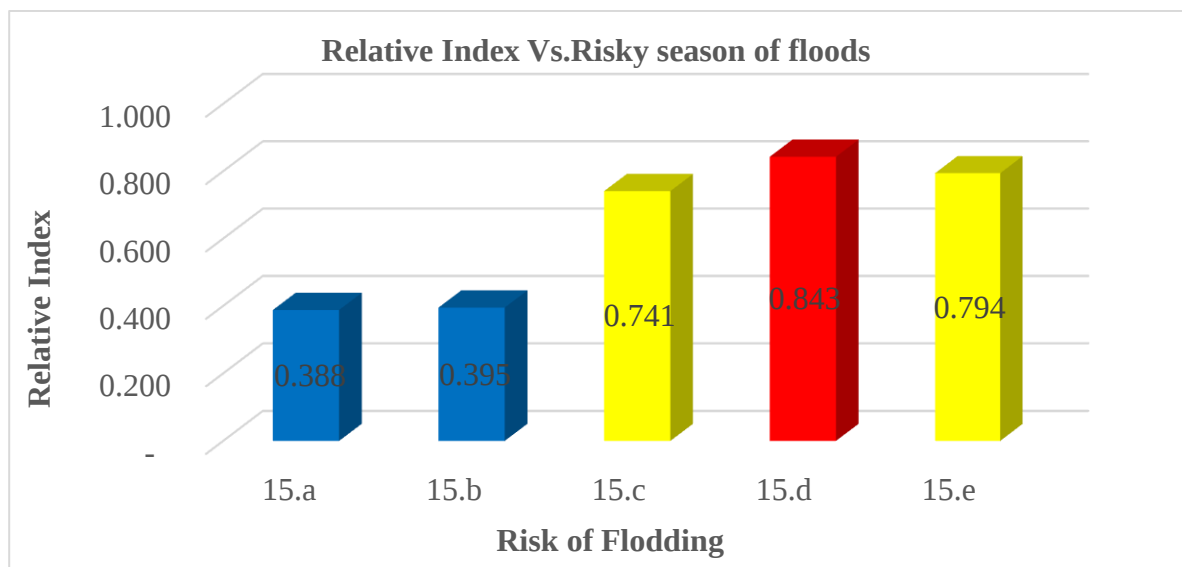


Figure 4.12 Risky season of floods

According to the findings highest risky season of the flood can be happened during period of harvest picking season. Lowest risky season of the flood can be happened during the period of land preparation season.

4.6.2 Difficulties in obtaining drinking water for the resettled communities

Table 4.12 and Figure 4.13 show responses received from questionnaire survey regarding the problems of drinking water facilities for their daily activities.

Table 4.12 Relative indices for difficulties of obtaining the drinking water.

No	Available Water Facilities	Relative Indices
16.a	Common wells are not enough in resettlement area	0.376
16.b	Water capacity is not enough in own well	0.545
16.c	Water quality is not enough in the tube wells	0.408
16.d	Very far from available water resources from their houses	0.496
16.e	No government involvement to supply the water demand	0.825

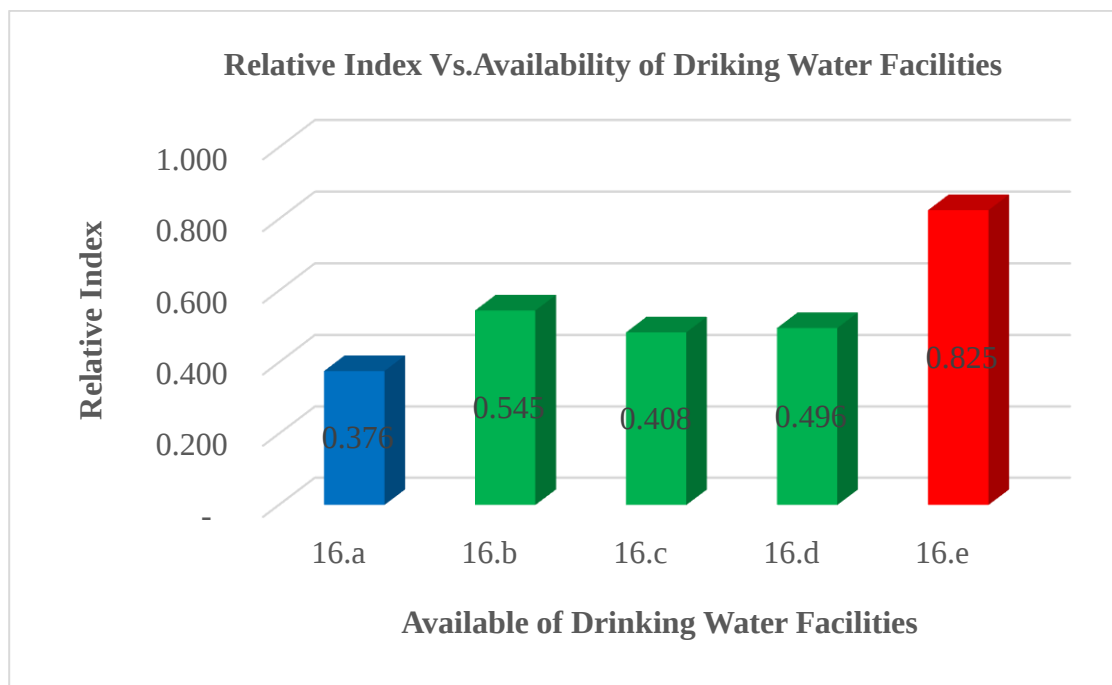


Figure 4.13 Difficulties of drinking water facilities

According to the findings highest RI value is 0.825 which is lack of government involvement to supply the water demand for resettled communities. Lowest RI value is 0.376, which if they have public wells it was not sufficient fulfill the water demand of the resettled communities.

4.6.3 Problems of wildlife migration

The responses received from questionnaire survey regarding the problems of wildlife migration to their life style is shown Table 4.13 and Figure 4.14

Table 4.13 Relative indices of problems in wildlife migration

No	Wildlife migration	Relative Indices
17.a	Destruction of paddy cultivation	0.904
17.b	Destruction of chena cultivation	0.473
17.c	It's difficult to spend the night at home	0.417
17.d	Impairment of education in schools	0.470
17.e	Risk of infectious diseases in animals	0.346

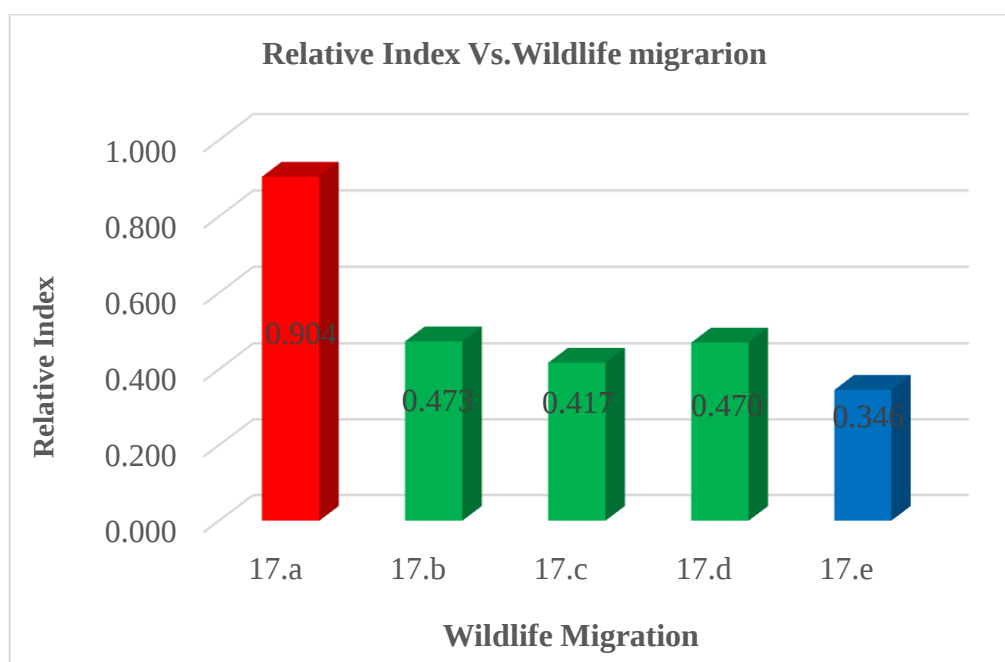


Figure 4.14 Problems of the wild life migration

Under these findings destruction of the paddy cultivation was the major problem and risk of infection diseases by the animals was smallest issue on the wild life migration for the resettled communities.

4.6.4 Problems due to the loss of paddy land

Table 4.14 and Figure 4.15 show responses received from questionnaire survey regarding how to affect loss of paddy lands for resettled communities economic

Table 4.14 Relative indices for problems on loss of paddy land

No	Loss of Paddy Land	Relative Indices
18.a	Inadequate compensation for loosed paddy lands	0.834
18.b	Paddy lands very far from their houses	0.419
18.c	There is no suitable irrigation system to obtain water for paddy lands	0.431
18.d	Inadequate received land area for cultivation.	0.857
18.e	There is no action to protect existing paddy lands from wild animals.	0.404

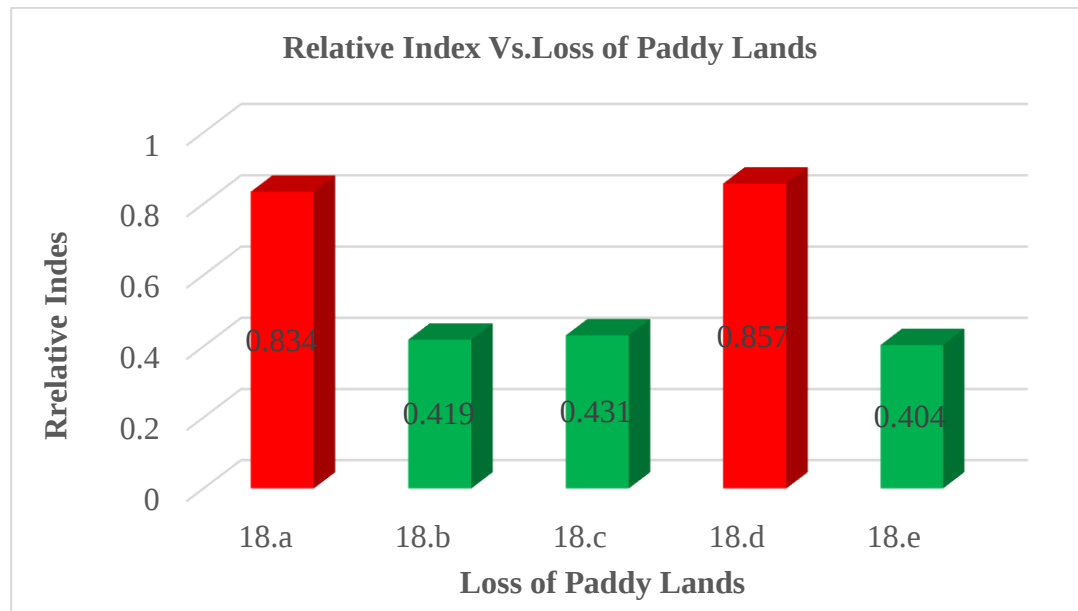


Figure 4.15 Problems of the resettled communities on loss of their paddy lands

According to the above bar chart, unsatisfaction of compensation for loosed paddy lands was the major problem and lack of precautions to protect the existing paddy lands from wild life was the smallest problem to the resettled communities.

4.6.5 Impacts on the Infrastructure facilities

Table 4.15 and Figure 4.16 show responses received from questionnaire survey regarding to Impacts of Infrastructure facilities.

Table 4.15 Relative indices for impacts to the Infrastructure facilities

No	Impacts of Infrastructure Facilities	Relative Indices
19.a	Lack of good quality roads to reach the cities	0.482
19.b	Lack of enough facilities for the study of schools	0.443
19.c	Government institutions very far from the resettlement area.	0.395
19.d	Loss of religious places	0.351
19.e	Inadequate electricity and telecommunication facilities.	0.436

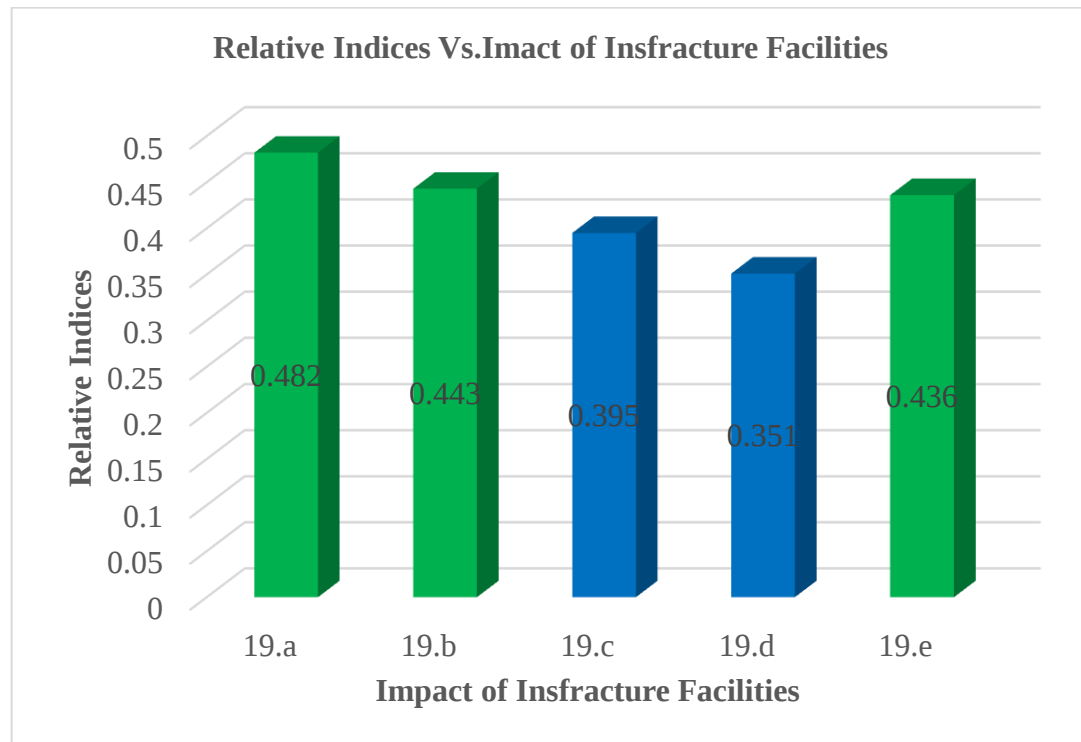


Figure 4.16 Impacts of infrastructure facilities

As per the above bar chart all the problems were medium impacted problems for the resettled communities.

4.6.6 Impact of livelihood

Responses received from questionnaire survey regarding affect to their livelihood on development projects is shown Table 4.16 and Figure 4.17.

Table 4.16 Relative indices for impacts to the livelihood

No	Impacts of Livelihood	Relative Indices
20.a	Inadequate income from the paddy lands	0.852
20.b	Difficulties when travelling to the place of occupation.	0.505
20.c	The business people were loosed their customers.	0.333
20.d	Inadequate income from chena lands	0.733
20.e	No sufficient lands for animal feeding.	0.541

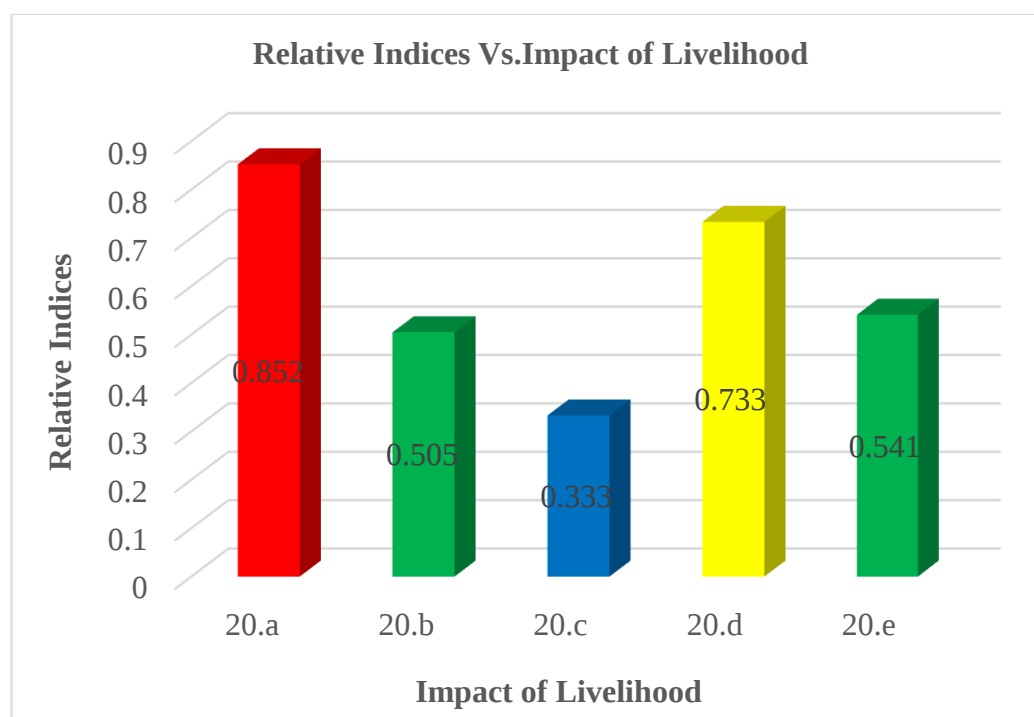


Figure 4.17 Impacts of livelihood

As per above findings inadequate income from the paddy lands was the major problem and business people lost their customers was the smallest issue for the resettled communities.

4.6.7 Environmental effects

Table 4.17 and Figure 4.18 reveal interruptions to the resettled communities from the environment for their economic condition.

Table 4.17 Relative indices for environmental effects

No	Environmental Effects	Relative Indices
21.a	Land degradation due to the vegetation removal	0.364
21.b	Increase the temperature in the environment due to the removing of the trees in the resettlement area	0.381
21.c	Change the surface ground water flow path in construction phase.	0.254
21.d	High soil erosion in rainy season	0.495
21.e	The petroleum products have been infiltrated in to the ground from machineries.	0.299

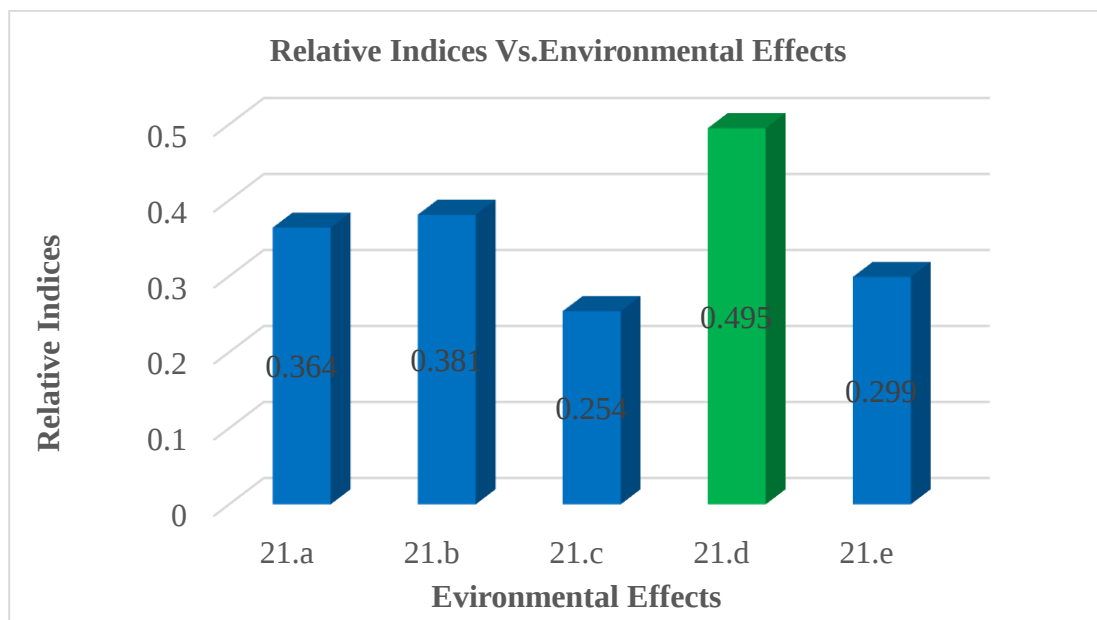


Figure 4.18 Environmental effects

According to the above bar chart problem on the high soil erosion RI value is 0.495 and it was the medium impacted problem for the resettled communities. Other problems were low impacted to the resettled communities.

4.6.8 Summary of relative indices Vs highly impacted problems & very highly impacted problems

Figure 4.19 shows highly impacted problems and very highly impacted problems.

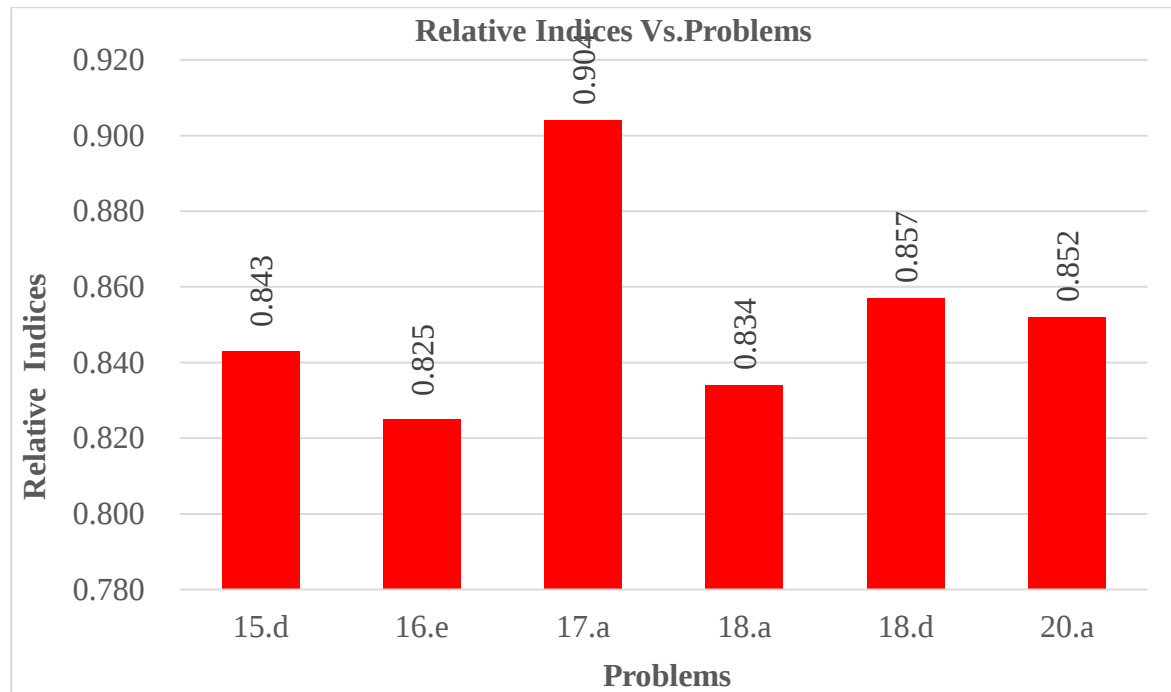


Figure 4.19 Summary of resettled communities' problems

According to the above bar chart all the values of RI , $0.8 < RI < 1$, since

15d. Flood can be happened in havest picking season

16e. No any government involvement to supply the water demand

17a. Destrution paddy cutivation by wildlife

18a Inadequate compensation for loosed paddy lands

18d Received land area not enough for the cultivation.

20a Inadequate income from the paddy lands

Problems were highly effected resettled communitites .

4.7 Low and very low impacted problems on resettled communities' survival

Table 4.18 shows Low and very low impacted problems on resettled communities.

Table 4.18 Relative indices for low and medium low impacted problems.

No	Problems	Relative Indices
15.a	Land preparation season	0.388
15.b	Fertilization season (first stage of paddy cultivation)	0.395
16.a	Common wells are not enough in the resettlement area	0.376
17.e	Risk of infectious diseases in animals	0.346
19.c	Government institutions very far from the resettlement area.	0.395
19.d	Lost the religious places	0.351
20.c	The business people lost their customers.	0.333
21.a	Land degradation due to vegetation removal	0.346
21.b	Increase the temperature in the environment due removing of the trees in the resettlement area	0.381
21.c	Change the surface ground water flow path in construction phase.	0.254
21.e	The petroleum products have been infiltrated in to the ground from machineries.	0.299

These problems do not have a serious adverse effect on the day-to-day life of the people. These problems can be grouped together and solved easily to reach the desired objectives as explained in previous, The Relative Indices ($0 \leq RI \leq 0.2$) are defined as very low impacted problems and Relative Indices ($0.2 \leq RI \leq 0.4$) are defined as low impacted problems for resettled communities living standard.

4.8 Medium impact problems for resettled communities' living standard

Table 4.19 shows Medium impact problems for resettled peoples.

Table 4.19 Relative indices for medium impacted problems of the resettled communities

No	Problems	Relative Indices
16.b	Water capacity is not enough in own well	0.545
16.c	Water quality is not enough in the tube wells.	0.408
16.d	Very far from available water resources from their houses.	0.496
17.b	Destruction of chena cultivation	0.473
17.c	It's difficult to spend night at home	0.417
17.d	Impairment of education in schools	0.470
18.b	Paddy lands very far from their houses	0.419
18.c	There is no suitable irrigation system to obtain water for paddy lands	0.431
18.e	There is no action to protect existing paddy lands from wild animals.	0.404
19.a	Lack of good quality roads to reach the cities	0.482
19.b	Lack of enough facilities for the study of schools	0.443
19.e	Inadequate electricity and telecommunication facilities.	0.436
20.b	Difficulties when travelling to the place of occupation.	0.505
20.e	No sufficient lands for animal feeding.	0.541
21.d	High soil erosion in the rainy season	0.495

Most of the resettled communities suffer from these problems. It can have a moderate effect for their daily activities. It is quite difficult to solve these problems. As explained previously, The Relative Index ($0.4 \leq RI \leq 0.6$) is considered as moderate impacted problems for resettled communities.

4.8.1 Water capacity was not enough for their own needs

Lack of adequate water for their daily usage is another major problem they are facing in this area, despite the fact the villagers have their own wells dug. Especially in the dry season this will seriously affect the living style of the people. They had to spend more money than the government gave them. People were guessed water table is very deep from the ground surface.

4.8.2 Water quality was not enough in the tube wells

Resettled communities were said it have provided tube wells as the remedy of the water shortage, the water is not good for use. Especially in this area diseases are very common and the government should pay more attention regarding this issue.

4.8.3 Very far from available water resources from their houses

If they have good quality water resources, they have to travel the long way to bring the water. They said that they have spent long time and additional cost to supply the water.

4.8.4 Destruction of chena cultivation

Resettled communities second major income is the chena cultivation other than paddy cultivation. Meanwhile, they had cultivated Maize, Cowpea, Green gram, Finger millets and Vegetables. These cultivations are destroyed by Elephant and Peacock since the second major income source losing out and they are asking the government to take necessary measures to mitigate this problem.

4.8.5 Impairment of education in schools

Even though new schools are being built in these areas by the government, they do not have provided sufficient facilities for the studies. Especially wildlife has been destroyed the school buildings and school children also have been attacked by Elephants time to time. Villagers pointed out that the schools are not equipped with adequate facilities to

protect wild animals. Since education does not get the desired results. Newly appointed teachers are reluctant to work in these schools and teachers who work here are soon transferred to other schools. Shortage of the teachers is the biggest problem for these schools and resettled communities commented the government should take necessary arrangements to resolve this issue.

4.8.6 Paddy lands very far from their houses

Before the Yan Oya Reservoir Development Project paddy lands of the villagers were very close to the houses and cultivation was done corporation with all the family members. Presently it's taken the long time to travel the paddy fields. Hence family members and neighbors cannot participate with the cultivation activities. Since cost of the paddy cultivation has raised up more than previously.

4.8.7 Lack of suitable irrigation system to obtain the water for paddy lands

Paddy fields and Chena lands were distributed by Irrigation Department among the people displaced by Yan Oya Reservoir Development Project. But there is no systematic Irrigated System to supply the water for paddy lands and chena lands. Since they have to pay the additional cost to resolve this issue. The villagers said, the water should be provided on time for the cultivation purpose for the expect income. Otherwise, the harvest will be down and lose the expect income.

4.8.8 There is no action to protect existing paddy lands from wild animals

Due to the thick forest cover around these villages, the migration of wild animals is very frequent. Among these animals Elephant, Peacock and Wildflowers are very common. The villagers said that at least elephant fences should be erected to protect the paddy lands around cultivated lands. The villagers have presented to relevant government agencies the threats of wild animals from time to time. But government has not taken necessary precautions to resolve this problem.

4.8.9 Lack of good quality roads to reach the cities

Although adequate roads have been provided by Irrigation Department those roads are damaged. The public transport service was also very poor. Especially School children are facing this bitter experience and villagers have complained regarding this problem. But no solution has been taken so far by the government.

4.8.10 Inadequate electricity and telecommunication facilities

Even though adequate houses have been provided to the resettled communities electricity has not yet been provided yet to these villages which is a fundamental part of infrastructures. Resettled communities were complained to Anuradhapura Electricity board time to time but they have not taken necessary actions to provide the electricity for these area. Officers of the Anuradhapura Electricity Board were said, allocated financial capacity is not enough to supply the electricity for this area. In addition to telecommunication facilities level also very poor. The reason for this telecommunication towers are not erected in this area to get the proper coverage. Private companies are reluctant to build towers in these areas because elephants destroy these towers.

4.8.11 Difficulties when travelling to the place of occupation

Resettled communities travel to their working place via public transport services, but those services are not enough to travel. These buses run very long routes and they take long time to travel the way. The villagers unable to get to work on time and some villagers are at risk of losing their jobs.

4.8.12 Inadequate sufficient lands for animal feeding

Animal feeding is another livelihood of these resettled communities. But they are facing lot of difficulties when they do the animal feeding. Main reasons for this they do not have enough lands for animal husbandry. Cows and Cocks are fed mainly by them and villagers manufacture curds and eggs for the market. Their income has dropped

significantly as there are not enough buyers to buy their products. Furthermore, there is a shortage of veterinary doctors in this area. As villagers are unable to provide medical facilities for their animals on time, even with minor illnesses, great effort must be made to heal the animals.

4.8.13 High soil erosion in the rainy season

Soil erosion is defined as the method by which productive topsoil is removed, resulting in a loss of soil productivity and decrease in the storage capacity of bodies in surface water. People explained that the reasons for this issue, during the construction of houses large amount of trees were removed in these areas. In addition to they mentioned about deforestation.

4.9 High and very high impacted problems for resettled community's living standard.

Table 4.20 show Relative indices for high and very high impacted problems for the resettled communities.

Table 4.20 Relative indices for high and very high impacted problems of the resettled communities

No	Problems	Relative Indices
15.c	At the time paddy plants (second stage of paddy cultivation)	0.741
15.d	Flood can be happened during the harvest picking season	0.843
15.e	Flood can be happened during the harvest selling season	0.794
16.e	No any government involvement to supply the water demand	0.825
17.a	Destruction of paddy cultivation by wild life	0.904
18.a	Compensation not enough for loosed paddy lands	0.834
18.d	Received land area not enough for cultivation.	0.857
20.a	Inadequate income from the paddy lands	0.852
20.d	Inadequate income from chena lands	0.733

High and very high impacted issues which have high chance of occurrence to the resettled communities. The RI ($0.6 \leq RI \leq 0.8$) is high impacted problems and RI ($0.8 \leq RI \leq 1$) is very high impacted problems of the resettled communities on daily activities.

4.9.1 Risk of flooding at the time of paddy plants (second stage of paddy cultivation)

Figure 4.20 show Respondent percentage for “Risk of flooding at the time of paddy plants (second stage of paddy cultivation)”

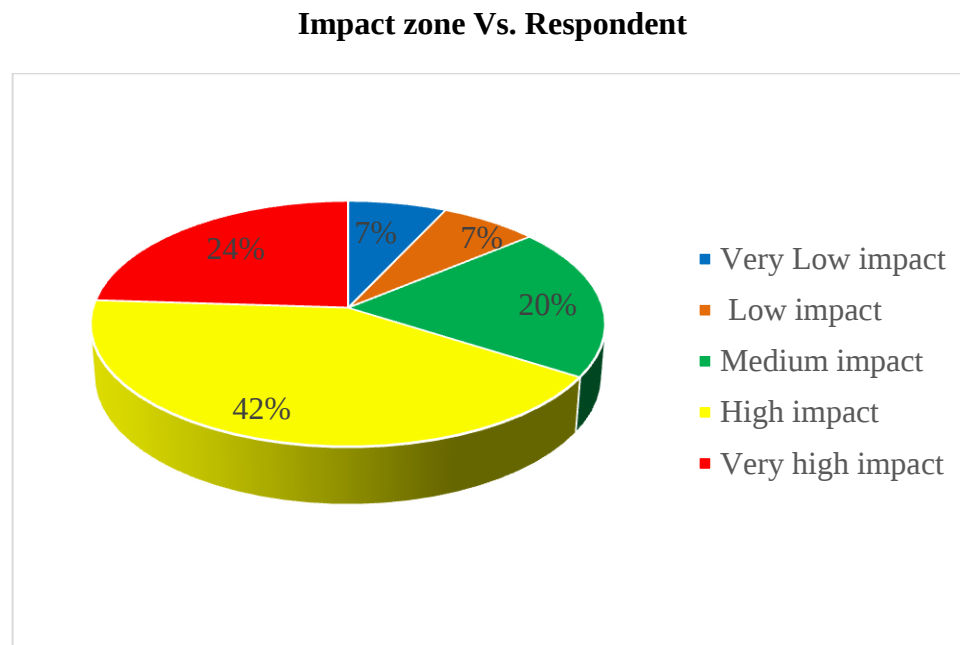


Figure 4.20 Respondent percentage for “Risk of flooding at the time of paddy plants (second stage of paddy cultivation)”

This issue can be highlighted as a common issue for all the resettled communities after the one month of paddy plants. By this stage they have expended more than half of the total cost for paddy cultivation. Therefore, if floods occur during this period this is a total lose of money spent so far.

Under these expenses lands preparation and buying paddy seeds are included. Hence the government should take the necessary arrangements to resolve this problem.

Resettled communities pointed out following points to mitigate the above problems.

- Provide the lands that are not threatened by floods in lieu of these lands.
- Establish strategies to provide the paddy seed to farmers at easy prices.
- Reconstruction of the drainage system which have been blocked by the YORDP.

4.9.2 Flooding in the Harvest picking season

Impact zone Vs Percentage of Respondents

Figure 4.21 show Respondents percentage for “Risk of flooding at the time harvesting picking season.

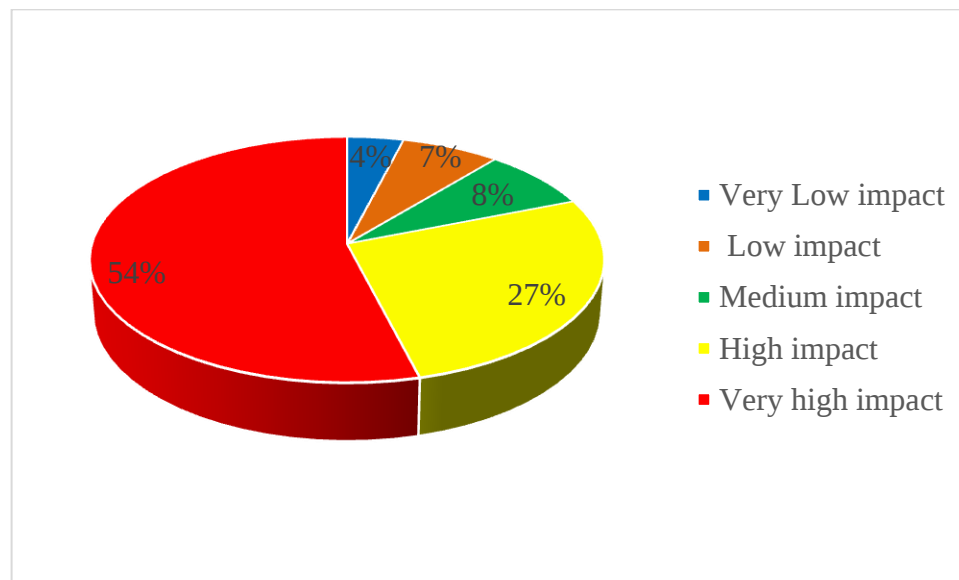


Figure 4.21 Respondents percentage for “Risk of flooding at the time harvesting picking season”

This is one of the main problem in many development projects in Sri Lanka following the relocated people. According to this pie chart it is clearly mentioned around 81% of questionnaire survey respondents, impact of flooding in harvest picking season strongly

impact for their living style. According to the respondents answers we can identify reasons for the flood.

- Received lands at a very low level from the sea level.
- This resettlement area located downstream of the Yan Oya Reservoir Development Project. Since when, spill gates are open immediately can be flooded this area.
- Changes of the surface water flow pattern due on YORDP.
- The proposed reservoirs will retain a large amount of flow which will obstruct the normal flow of the river.
- No any proper Irrigation system to control the flood during the rainy season.
The following controls can be identified, to overcome the resettled people issues based on their interviews.
- Resettled communities also should attend by the government, when select the relocation site before relocate the people.
- There should be a proper communication system between the resettled communities and Irrigation department to know that the sluice gates are open in the reservoir.
- When the governments choose the relocate sites there should be a more attention regarding characteristics of geography.
- The preparation of resettlement plans should be resettlement manner.

4.9.3 Risk of flooding during the harvest selling season

Impact zone Vs. Respondents

Respondent percentage for “Risk of flooding at the time harvest selling season” is shown Figure 4.22.

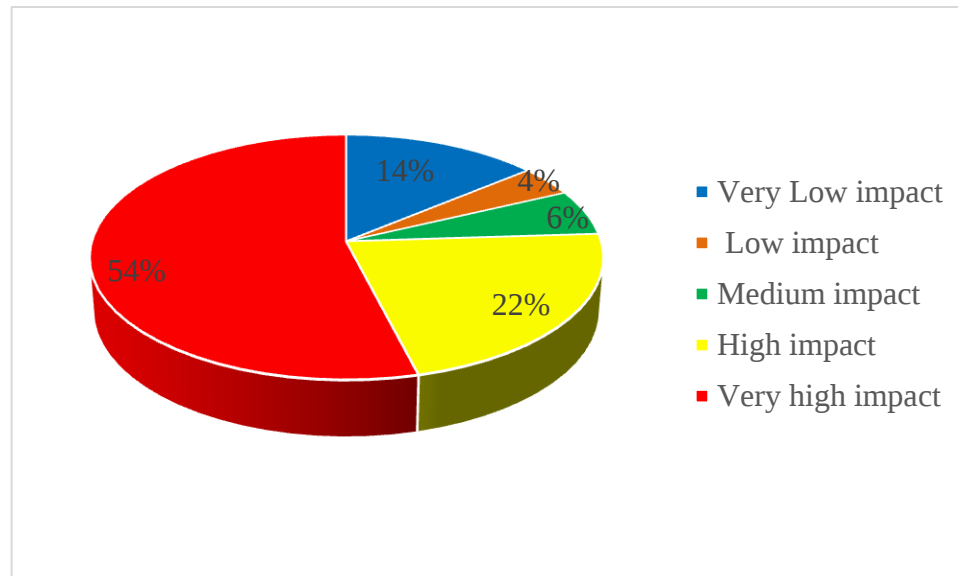


Figure 4.22 Respondent percentage for “Risk of flooding at the time harvest selling season

During this season many traders come to these areas to buy paddy and the roads are flooded due to the heavy rain of this area. Since traders cannot arrive to these villages. Since resettled communities are unable to sell their harvest directly to the buyers and they will sell harvest indirect buyers in the village. Since they do not get a fair price for the harvest. Resettled communities stated, as the remedies for these problems following procedure can be follow up.

- Purchasing the paddy by government at reasonable prices.
- Rehabilitation of alternative routes for transport the goods during floods.
- Introduction of an insurance scheme to cover the cost when the harvest cannot be sold.

4.9.4 Involvement of government agencies to supply the drinking water demand

Impact zone Vs Percentage of Respondents

Figure 4.23 shows Respondent percentage Government involvement to supply the drinking water demand.

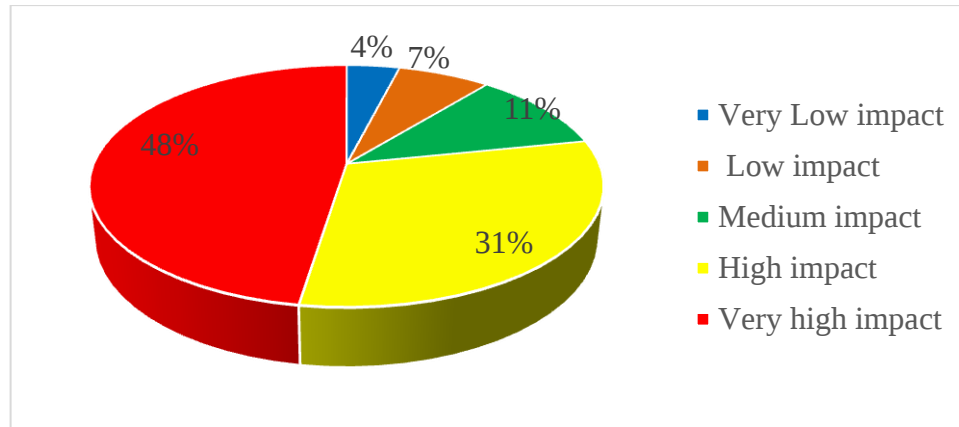


Figure 4.23 Respondents percentage for Government agencies involvement to supply the drinking water demand”

According to the questionnaire survey, around 77 % of respondents were responded lack of supply the drinking water for domestic purpose, strongly effect for their daily activities. The resettled communities clearly emphasize no any government agencies to resolve this problem. The resettled communities mentioned government should pay more attention regarding drinking water supply, because water will directly effect to the kidney diseases and it is a serious problem they are facing in these areas. (NWSDB) is responsible for supplying safe drinking water for population in the country. But problem is at present, it is difficult cannot find out the reliable water sources in this area. Interviews with resettled communities can be classified as control measures that can be found to address the problems described above;

- The YORDP will be a reliable water source and it can use after processing, as the drinking water to the residents of these relocated areas.

- Due to the conflicts among the different party politicians, the delay in supply of water for these areas.
- Provide enough financial capacity by NWSDB to supply water.

4.9.5 Destruction of paddy cultivation by wildlife migration

Impact zone Vs Percentage of Respondents

Figure 4.23 shows percentage of respondents, destruction of paddy cultivation by wildlife.

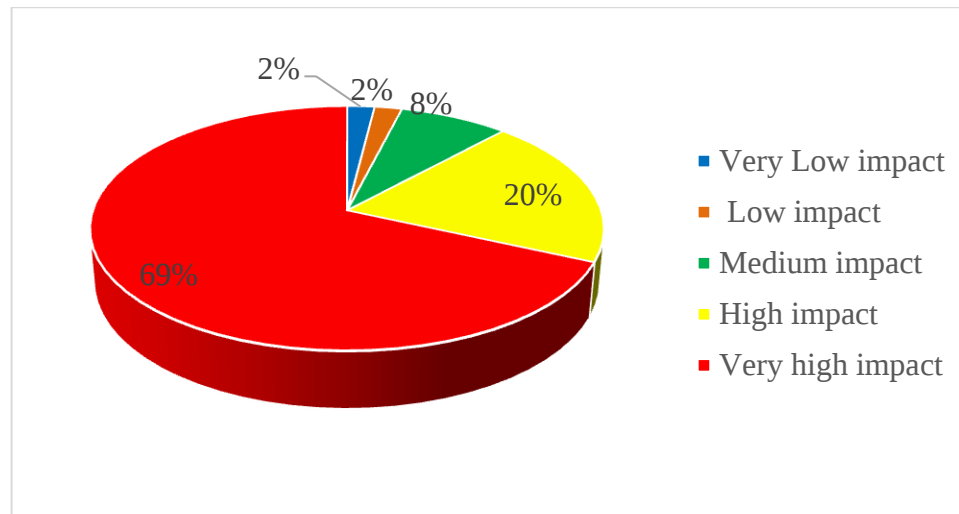


Figure 4.24 Respondents percentage for “Destruction of paddy cultivation by wildlife migration

The Majority of the respondents clearly answered for the questionnaires saying that the impact of the problem “Destruction of paddy cultivation due on wildlife migration” is strongly affected for the resettled communities on YORDP. The villagers stated that paddy cultivation is the major income of the life. But Wildlife migration and destroying of the paddy lands are the most critical problems they are facing in new resettlement areas. They strive to protect these paddy fields and they are following traditional methods to protect the paddy fields. Especially at the harvesting season this problem is intensified. Some respondents stated they have spent the whole of the money for paddy

cultivation. On the interviews, the following control points might be offered to address the above-mentioned issue:

- There should be Nature reserve, National parks, Elephant corridors, Forest reserve or protected wetlands.
- Erect the elephant fence around the PL for the safety of the lands.
- Government should introduce formal methods other than traditional methods protect the paddy lands at the night time.
- Establish the wildlife office in this area in the case of emergency time.
- Introduce the modern techniques and equipment to pick harvest quickly.
- Government interventions to make agricultural implements affordable.

4.9.6 Compensation not enough for lost paddy lands

Impact zone Vs Percentage of Respondents

Satisfaction level of the resettled communities on the compensation for lost paddy lands is shown Figure 4.25.

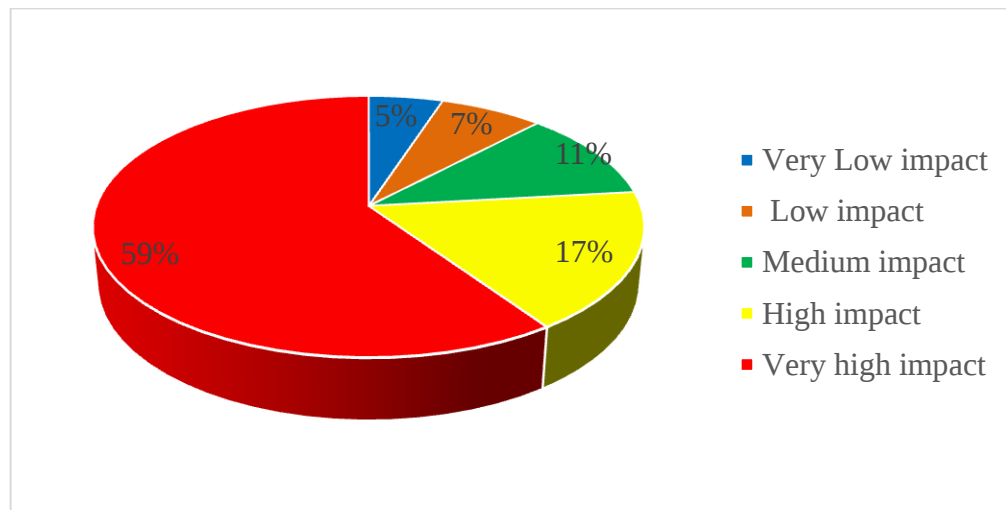


Figure 4.25 Respondent percentage for “Satisfaction of the compensation for lost paddy lands”

Around 76% of questionnaire survey respondent said that the inadequate compensation for the lost lands on YORDP in Sri Lanka. The resettled communities stated that most of the villagers were not satisfied with monetary compensation. Valuation was done by the Valuation Department for each lost lands. Another problem faced by some house holders is that they have done cultivation works without deeds for the lands. VD was rejected compensation for those lands it was also highly effected for their economy. Some lands were not properly surveyed, some HH were compensated for less than the required area of lands. While others were compensated for more than actual area of the lands. Another problem is the fact that the same amount of compensation was received for an acre lands located close to the main road and beyond to the main road. Another issue is inadequate number of officers land acquisition process, payment of compensation and resettlement activities and also there is only one senior resettlement officer under the project director at field. But they have not adequate facilities for effective works.

The following suggestions for resolving the aforementioned issues can be made during the interviews:

- Introduce the different compensation methods different located lands by VD as satisfied the beneficiaries.
- When pay compensation by VD to the resettled communities they should think deeply resettled communities problems make a reasonable compensation.
- Expedite the payment process by providing adequate facilities and recruit adequate officers for it.

4.9.7 Received land area not enough for the cultivation.

Impact zone Vs Percentage of Respondents

Figure 4.26 shows respondents percentages on received land area for cultivation.

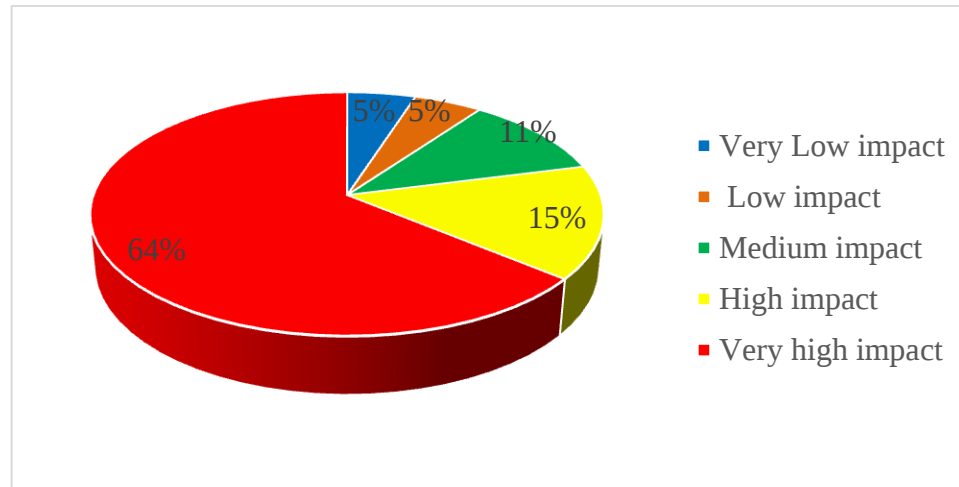


Figure 4.26 Respondent percentage for “Received land area not enough for the cultivation”

This can be identified as most of the resettled communities main income are paddy cultivation and chena cultivation. 79% of questioner survey respondent stated that above problem makes extremely impact for their living standard. The HH stated the area of land received is less than the previously cultivated lands and the amount of the money received for the remaining lands is insufficient. Meanwhile they cultivated without deeds for some lands but they did not receive lands for those lands. Some of the lands were too far away from the village and there were not adequate ways to travel to the lands. Since it was very difficult to transport the machineries for cultivation purpose. According to the interviews, the following control strategies for resolving this problem can be offered.

- Provide the Yala and Maha cultivable lands in an easy to maintain area from their residence.
- Take the action to provide the lands with one place.

- The lands provided should be irrigated from YORDP.
- Take the action to pay compensation for unauthorized farming lands given by the government.
- Provision lands for sub families in these areas.

4.9.8 Inadequate income from the paddy lands

Impact zone Vs Percentage of Respondents

Figure 4.27 shows respondents percentages on income from the paddy lands.

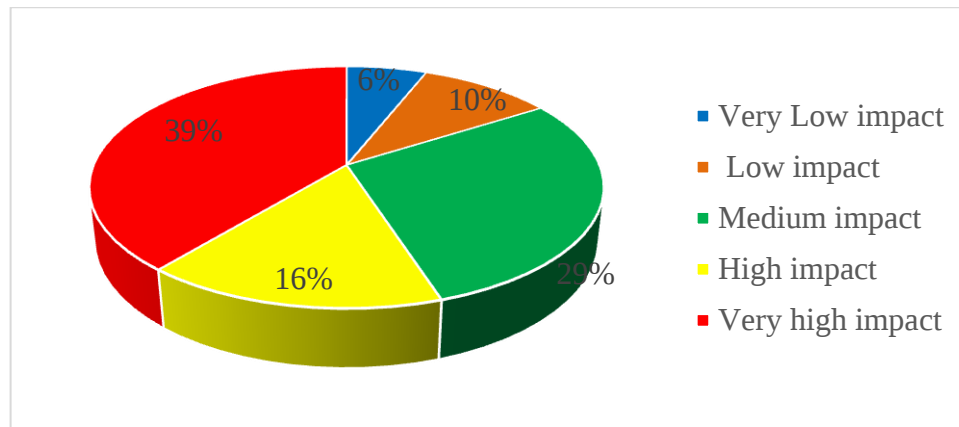


Figure 4.27 Respondent percentage for “Inadequate income from the paddy lands”

According to the above questionnaire 80% of resettled communities agreed inadequate incomes from the paddy lands are extremely affected for their economy. The interviewers stated soil of these areas is unfertilized and not suitable for cultivation. Previously they were cultivated several acres illegal and earned good income on fertilized lands. Another possible cause is reduced harvest and increased risk of disease for the paddy. Meanwhile, some HH said reducing the moisture content of the earth is effected to reduce the harvest. According to the interviews, the following control strategies for resolving this problem can be offered.

- Introduce the modern technology for villagers to minimize the deceases affected to the harvest and increasing the harvest.
- Distribute fertilize lands among the HH.
- Introduce the low cost methods to increase soil fertility.

4.9.9 Inadequate income from chena lands

Impact zone Vs Percentage of Respondents

Figure 4.28 shows respondents percentages on income from the chena lands.

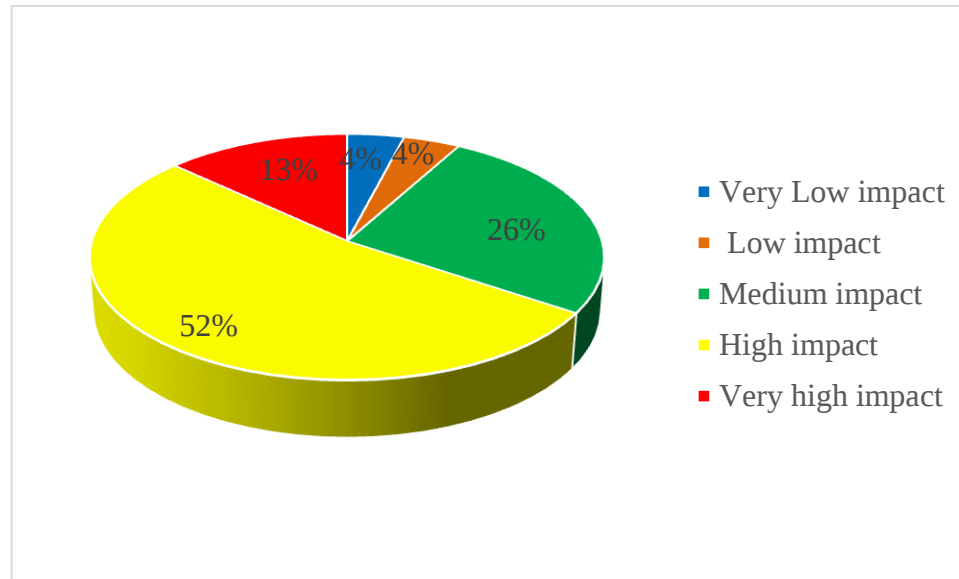


Figure 4.28 Respondent percentage for “Inadequate income from chena lands”

Cultivation of chena is another income for these resettled communities. They earn significant income from chena cultivation. Because the low harvesting of these chena, their economic status has dropped significantly.

The following control measures can be suggested to address the above problem as per the response of the relocated communities

- .Provide the adequate chena lands area for the resettled communities.
- Establish the market to sell harvest intervened the government.
- Introduce the modern technologies to increase the harvest.
- Training programs for farmers about handling of the modern equipment's for chena cultivation.

4.10 Summery

This chapter has discussed the analyzed data collected from the resettled communities regarding on the problems they create on YORDP in Sri Lanka. The data analysis began with a demographic analysis, followed by a questionnaire survey and then a detailed analysis of the variables using the Relative Importance Index method. According to the interview was held with resettled communities, it was identified in day to day work 35 questions are encountered by resettled communities. Through the analysis, it was identified that most of dwellers were being suffering loss their paddy lands. Most of the resettled communities stated the new lands received from the government are not adequate to compensate for the lost land and the compensation received for the lost lands is inadequate. It is extremely effected for their economy and main fact for this, the main source of the income was paddy cultivation of the resettled communities. Meanwhile according to the analysis major problems are risk of flooding at the time of harvest picking season, no any government institution involve to supply the drinking water for these areas. People emphasized this area is very common for the kidney disease and therefore government should be more careful about drinking water of these relocated areas. This analyze revealed another biggest problem in these areas is destruction of paddy land by the wildlife and villagers stated that wild elephants were the mainstay among these animals. Inadequate income from the received paddy lands is directly drop their income and main reason for this the villagers explained the soil of the land is barren for cultivation purpose.

CHAPTER 05

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter mainly includes conclusion, recommendations, limitation and it has provided knowledge for future researches at the end. Further, it has included a brief research assessment.

As per this study, the feedbacks received from resettled communities displaced as a result of YORDP have been taken into account who are living in Malporuwa, Kajuwatta, Omarakada and Wahalkada area in Anuradhapura District. The Majority of the respondents were farmers in this area. On factors of social and economic, the problems were initially estimated of the resettled communities.

It is observed that the majority of the respondents were suffering from different type of problems. These issues have affected many people in different ways for their daily activities. The Majority of them had been known about YORDP. The selected case study was analyzed using with seven problem areas which are facing by resettled communities currently. Conclusion, recommendations, limitations and input for further research on the basis the findings are contained in this section.

5.2 Conclusions

The research was started with literature findings of development project problems faced by resettled communities and on case Study of Yan Oya Reservoir Development Project. Resettled communities' problems can be identified based on the disruption causes to their normal lifestyle due to the YORDP in Sri Lanka.

In achieving research aims and objectives, it begins with reviewing the resettled communities problems in development projects as the first objective of the study. It is a new experience for those people who have lost their old habitations and are relocating to new places. Therefore, they have to face many problems when resettled. Since government should effectively manage their problems and immediate solutions provide to resolve the issues.

In the process of the fulfilling the research goals and objectives the second objective is to identify demographic characters of the resettled communities. Based on the literature review and initial discussion, 25 numbers of problems were recognized under 4 sections in the quaternaries survey. Those are; seasonal flood in risk resettlement area in rainy season, difficulties of availability drinking water supply, wildlife migration for resettled communities' lands, problems on loss of paddy lands, impact of infrastructure facilities, impact of livelihood and environmental impacts of their surrounding areas.

Flooding at the time of paddy plants, harvest picking season, harvest selling season, no government agencies supplying drinking water for the resettled communities, destruction of paddy cultivation by wildlife, lack of financial compensation for lost lands of the resettled communities, inadequate reclaimed lands for lost lands for the cultivation, inadequate income from the paddy lands and chena lands are problems that were recognized as strongly effected for the land resettled communities.

The 3rd and 4th objectives were identifying the attitudes of resettled communities towards resettlement and identifying the problems faced by the displaced communities.

In terms of demographic variables in resettled communities, it shows that are majority are between the ages of 41 and 60. The main income generating activity of resettled communities is farming with average monthly income of between Rs 26,000- Rs 30,000. It was revealed that majority of the dwellers in the communities highest educational qualification is secondary school leaving from General Certificate of Education Ordinary Level and very few dwellers have received university education.

The survey showed that most of the resettled communities gained awareness of the concept and idea of IDP through the articles from television, radio, friend or relative and newspaper etc the articles from television, radio, friend or relative and newspaper etc., most of the resettled communities are aware of the concept and idea of IDP. It was also explained that most of the members of the HH knew about the YORDP before commence construction of the project. Most of the resettled communities knew about YORDP through government of Sri Lanka. According to the survey questionnaire and interview held, expectations were very high of the resettled communities on YORDP. The Majority of them were expected increase the existing land value and others were expected job creation, infrastructure development and develop of the environmental quality. Under Infrastructure development they expected roads, electricity, portable water supply, etc., enhanced skill training in artisanal related trade, improved health and social well -being through provision of schools, health centers, etc.

5.3 Recommendations

The following section focuses on a suggestion for resolving the negative effects of resettled communities' problems on the YORDP in Sri Lanka. The following aspects are might be highlighted as recommendations for resolving the beneficiaries' problems on based on the findings of this research.

5.3.1 Taking necessary measures to control floods

Paddy cultivation is the main livelihood of these villagers, therefore the government should provide with adequate lands and facilities for cultivation activities. Provided lands are situated in downstream of the Yan Oya Reservoir, when during the spill gates are opened the lands are submerged. In the meantime, provided lands are situated below the normal level of the paddy fields, even in a small rainfall these lands are submerged. Since it is recommended proper irrigation system excess water drains away quickly. In addition, instead to received lands, lands should provide from another area with facilities with cultivation activities. The government should agree with the resettled communities about the lands from which lands are given prior to granting the lands for resettlements. Also, an insurance scheme should be introduced for lands affected by floods. Government should inform to farmers of the possible time period of floods.

5.3.2 Reimbursement of reasonable compensation for lost property

The biggest challenge they had faced the loss of their homes and lands to YORDP. Under this, the Government of Sri Lanka donated money and lands as compensation for the resettled communities. Nevertheless, this irregular compensation has caused rift among the villagers. Therefore, recommended compensation should be given as per the laws governing land acquisition and compensation in Sri Lanka and compensation should be the most reasonable market value. Further Special consideration should be given when accounting for the probable high increase in the land values.

Most of the re-settlers' livelihood depends on their lands. So during relocation they are needed to provide with sufficient land to carry out their livelihood instead of lost lands.

When providing the new locations for evacuated businessmen, the government should support them to start the business, providing them with bank facilities and other government aids to develop their business. Most of the relocated communities have larger area of lands as highlands or paddy lands. Majority of these lands are encroached. Since, they expect the reasonable extents of lands losing their current land holdings and

compensation for the lands. Sub families and the main family live in same house due to the poverty of these people. Since at least providing piece of land as a compensation can be alleviate the dysfunction of these sub-families.

5.3.3 Controlling wild life migration

Due to the forest reserve surrounding these villages, wildlife can severely impact on their farmlands and homes. Wild elephants, peacocks, wild boars and deer predominate and wild elephants pose a threat to paddy fields, chena lands and homes of resettled communities and sometimes people lose their lives too. Migration of wild animals is most common during the harvest season and the damage is immense. For this reason it is recommended reserve the elephant corridors and forest reserves. Another recommendation is set up the elephant fences around the lands to mitigate destruction from the wild elephants for the paddy lands. Wildlife offices are far away from these villages and it takes a long time for these officers to visit these villages in an emergency time. Therefore, it is very important to establish a wildlife office in this village as well. The government pays compensation for loss properties by wildlife, which is insufficient relative to the destructed properties. Since compensation should increase to suit the current economic conditions of the country.

5.3.4 Enhancement of livelihood of the resettled communities

Paddy and Chena cultivation are the main income of these resettled communities in this area and very few are employed in Animal husbandry, trade and small jobs outside the village. Their main source of income is farming, Therefore, when the land is distributed among the resettled communities fertile lands should be provided to increase the harvest. Meanwhile suitable lands should be provided to Livestock farmers for animal husbandry. For the people who do business, the necessary infrastructure need to be developed such as roads, water, power supply ,education, telecommunication, health facilities, postal facilities and other supporting facilities for the prospective future

demands. Especially the villagers, those who work outside the village, must have a high standard of transport service to get to their place of work on time.

5.3.5 Establish ways to meet the drinking water requirement of the resettled communities.

Kidney diseases, which is endemic and common for this area. The disease causes significant deaths in the area annually. According to research by researchers, the main cause of the disease is the lack of quality of drinking water. Therefore, public institutions should look into the drinking water problem which is one of the basic needs of the people and pay more attention to provide the pipe borne water for the beneficiaries. Normally NWSDB is responsible to provide the clean drinking water to the country. At the present, only one water filter is installed in one public place for whole of the villagers to provide drinking water, but this is not adequate to meet the water requirement of the resettled communities.

5.4 Future Research

This research revealed social and economic condition of the resettled communities, what are the problems of resettled communities are facing on YORDP and understanding and perceptions about YORDP. Future research can be done investigating resettled communities problems based on the factors such Gender, Age Group, Occupation and Civil statues in this area. Further after resolving these problems satisfaction level of resettled communities can be investigate as future research.

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APPENDIXES

APPENDIXE –A

PRELIMINARY INTERVIEW GUIDE LINE

- 1) What is the most risky season can be happened flood in resettled area?
- 2) What are the difficulties when they obtain the drinking water for their daily needs?
- 3) What are the expectations the YORDP?
- 4) Did the YORDP lead to any displacement in their families?
- 5) What are problems they face on the wildlife migration?
- 6) Which type of difficulties they face on the newly received paddy lands as the compensation?
- 7) What are the difficulties they face due to the lack of infrastructure facilities?
- 8) Which type of problems they get travelling to the place of occupation?
- 9) What are environmental effects on the YORDP?
- 10) In your opinions, what has been the effect of the YORDP of this community it is positive or negative for their economy?
- 11) Do you think all the relocated communities get the reasonable compensation for their loosed properties?
- 12) What are the precautions to mitigate relocated communities problems?
- 13) Do you think government has implemented the proper relocating planning?

APPENDIXE –B

QUESTIONNAIRE SURVEY

UNIVERSITY OF MORATUWA

FACULTY OF ARCHITECTURE

DEPARTMENT OF BUILDING ECONOMICS

Community Area: _____

I am an MSc student of the above named department and university conducting a field survey on the effects of development projects for resettled communities. This questionnaire is intended to find out the Yan Oya Reservoir Project on the communities within its inundation area. The result will be used purely for academic purposes as part of my final year dissertation, therefore all necessary information given will be treated with utmost confidentiality. I sincerely seek your compliance and cooperation.

SECTION A: DEMOGRAPHIC CHARACTERISTICS

1. Gender:

a)	Male	
b)	Female	

2. Respondent age group:

(a)	20 -40 years	
(b)	41 -60years	
(c)	61 -80 years	
(d)	81 or above	

3. Civil Status:

(a)	Single	
(b)	Married	
(c)	Divorce	
(d)	Widowed	

4. Occupation:

(a)	Farming	
(b)	Trading	
(c)	Craftsmanship	
(d)	Unemployment	

5. Average monthly income:

(a)	Rs, 21,000– 25,000	
(b)	Rs26, 000 – 30, 000	
(c)	Rs 31,000 -35,000	
(d)	Rs36,000 or above	

6. Highest Educational Qualification:

(a)	Primary School	
(b)	Secondary School	
(c)	Vocational/Technical	
(d)	University	

SECTION B: UNDERSTANDING AND PERCEPTIONS OF THE PROJECT

8. Do you know the any other Irrigation development project?

(a)	Yes	
(b)	No	

9. If yes to question 8, where did you learn the meaning of an Irrigation development project?

(a)	On the television	
(b)	On the radio	
(c)	From a friend or relative	
(d)	Newspaper, magazine, etc	

10. Do you know the Yan Oya Reservoir development project?

(a)	Yes	
(b)	No	

11. When did you first learn of the development?

(a)	Before construction of the project	
(b)	After construction of the project	
(c)	During construction of the project	

12. What source did you first learn of the Yan Oya Reservoir Project?

(a)	Government of the Sri Lanka	
(b)	Representative of the Irrigation officer	
(c)	Your political leader	
(d)	other specify	

13. Do you believe that there are benefits that will emerge from the development (a)

Yes (b) No

(a)	Yes	
(b)	No	

14. What are your expectations from the development?

(a)	Job creation	
(b)	Infrastructural improvement	
(c)	Increased value of land	
(d)	Improvement of environmental quality	

SECTION C: ENVIRONMENTAL AND SOCIO ECONOMIC ISSUES

1 to 5 Scale is given as below

Scale	Impact level of the beneficiaries
1	Very Low impact problems
2	Low impact problems
3	Medium impact problems
4	Highly impact problems
5	Very High impact problems

	DEVELOPMENT PROJECTS AND THEY CREATE PROBLEMS FOR RESETTLED COMMUNITIES	SCORE				
		1	2	3	4	5
15.	Risky season of flood					
15.a	Land preparation season					
15.b	Fertilization season (first stage of paddy cultivation)					
15.c	At the time paddy plants (second stage of paddy cultivation)					
15.d	Harvest picking season					
15.e	Harvest selling season					
16.	Difficulties in obtaining drinking water					
16.a	Common wells are not enough in resettlement area					
16.b	Water capacity is not enough in own well					
16.c	Water quality is not enough in the tube wells.					
16.d	Very far from available water resources from their houses.					
16.e	No any government involvement to supply the water demand					
17.	Problems of wildlife migration					
17.a	Destruction of paddy cultivation					
17.b	Destruction of chena cultivation					
17.c	It's difficult to spend night at home					
17.d	Impairment of education in school					
17.e	Risk of infectious diseases in animals					
18	Loss of paddy lands					
18.a	Inadequate compensation for loosed paddy lands					
18.b	Paddy lands very far from their houses					
18.c	There is no suitable irrigation system to obtain water for paddy lands					
18.d	Received land area not for the cultivation.					
18.e	There is no action to protect existing paddy lands from wild animals.					

	DEVELOPMENT PROJECTS AND THEY CREATE PROBLEMS FOR RESETTLED COMMUNITIES	SCORE				
		1	2	3	4	5
19	Impacts of infrastructure facilities					
19.a	Lack of good quality roads to reach the cities					
19.b	Lack of enough facilities for the study of schools					
19.c	Government institutions very far from the resettlement area.					
19.d	Lost the religious places					
19.e	Inadequate electricity and telecommunication facilities.					
20	Impact on livelihood					
20.a	Inadequate income from the paddy lands					
20.b	Difficulties when travelling to the place of occupation.					
20.c	The business people lost their customers.					
20.d	Inadequate income from chena lands					
20.e	No sufficient lands for animal feeding.					
21	Environmental effects					
21.a	Land degradation due to the vegetation removal					
21.b	Increase the temperature in the environment due to the removing of the trees in the resettlement area					
21.c	Change the surface ground water flow path during the construction phases.					
21.d	High soil erosion in rainy season					
21.e	The petroleum products have been infiltrated in to the ground from machineries.					

SECTION D: LEVEL OF SATISFACTION FOR THE PROJECT AND COMPENSATION

22. Has the development of Yan Oya Reservoir project your living standard?

(a)	Yes	
(b)	No	

23. Did the development lead to any displacement in your family?

(a)	Yes	
(b)	No	

24. If yes, did you receive any form of compensation?

(a)	Lands	
(b)	Money	

25. When were you compensated?

(a)	Before resettlement	
(b)	During the period of resettlement	
(c)	After resettlement	

26. Which of the following describes your level of satisfaction of the compensation?

(a)	Very highly satisfied	
(b)	Very Satisfied	
(c)	Satisfied	
(d)	Neutral	
(e)	Not satisfied	

27. In your opinions, what has been the effect of the Yan Oya Development Project for the communities?

(a)	Positive	
(b)	Moderate	
(c)	Negative	

APPENDIXE –C

MEAN SCORE CALCULATION OF QUESTIONNAIRE RESULTS

		Respondents													
Problems		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14
	15.a	1	1	1	3	4	1	2	4	1	3	2	1	1	1
	15.b	2	1	1	2	1	3	3	3	1	1	1	4	2	1
	15.c	3	4	5	4	5	4	4	4	4	5	4	5	4	5
	15.d	5	4	5	4	5	4	5	4	5	3	5	4	5	5
	15.e	5	4	5	5	5	5	4	5	4	1	5	4	5	5
	16.a	2	1	1	2	1	3	1	1	2	3	3	1	1	1
	16.b	3	2	4	3	1	4	4	1	3	5	1	4	5	1
	16.c	4	5	3	3	1	1	2	4	3	2	1	1	1	2
	16.d	1	1	4	1	1	2	4	5	1	1	4	5	3	3
	16.e	5	5	5	3	4	5	5	4	3	5	4	3	5	4
	17.a	1	5	4	3	5	4	5	4	4	4	5	5	5	5
	17.b	5	1	1	2	2	2	2	2	3	3	3	2	5	1
	17.c	1	3	2	1	2	2	2	2	5	4	1	3	2	2
	17.d	2	2	3	3	2	3	3	1	2	3	3	3	1	2
	17.e	1	2	3	1	2	1	2	2	2	2	2	3	2	1
	18.a	5	2	3	2	5	5	5	1	5	2	1	5	5	5
	18.b	1	1	3	2	3	3	2	2	1	1	2	3	1	1
	18.c	2	2	1	1	1	1	1	1	2	3	3	3	3	1
	18.d	5	4	5	5	1	2	5	5	5	5	5	3	4	5
	18.e	1	1	1	2	4	1	2	2	4	2	3	1	2	4
	19.a	2	3	1	5	1	1	2	2	3	1	4	1	2	3
	19.b	4	1	1	2	3	4	1	1	2	3	3	1	1	2
19.c	1	2	3	3	4	3	2	1	1	2	1	3	1	1	
19.d	1	2	2	2	2	2	1	2	3	1	1	1	3	2	
19.e	2	3	2	1	4	1	1	2	3	2	4	2	3	3	
20.a	5	4	5	5	5	5	5	3	5	4	3	5	5	5	
20.b	1	2	3	1	1	1	1	2	4	5	4	4	4	1	
20.c	1	1	2	2	1	1	2	2	1	1	2	1	1	1	
20.d	4	4	3	4	4	4	3	4	3	4	4	4	4	5	
20.e	4	5	1	3	4	5	4	5	2	2	1	2	3	2	
21.a	2	1	3	1	2	1	4	2	3	1	1	5	1	2	
21.b	5	4	1	1	1	2	1	3	1	2	2	2	2	2	
21.c	1	2	1	2	2	1	1	1	1	1	1	1	2	1	
21.d	3	1	2	3	1	4	4	4	2	3	1	4	4	5	
21.e	1	1	1	1	1	1	1	2	1	1	1	2	1	2	

	Respondents															
		R15	R16	R17	R18	R19	R20	R21	R22	R23	R24	R25	R26	R27	R28	R29
Problems	15.a	2	3	2	5	1	2	1	1	1	1	4	3	2	1	3
	15.b	1	3	1	2	1	4	2	4	4	1	4	2	2	1	1
	15.c	3	4	5	3	3	4	3	5	4	4	4	5	5	4	4
	15.d	5	5	5	5	5	5	5	5	5	5	4	2	1	5	5
	15.e	4	1	5	5	5	5	4	1	4	5	5	5	5	5	4
	16.a	1	1	1	3	2	2	4	4	1	1	1	1	1	2	3
	16.b	3	1	1	1	4	5	1	4	5	2	5	4	1	3	4
	16.c	3	4	4	4	3	4	1	2	2	3	3	3	3	1	1
	16.d	3	3	3	4	2	1	5	1	5	1	5	4	1	2	3
	16.e	3	4	5	5	5	4	5	4	3	1	4	2	4	2	1
	17.a	5	3	5	5	3	5	5	5	5	5	5	5	4	5	3
	17.b	2	3	4	1	5	3	2	1	3	2	2	3	2	4	2
	17.c	1	4	2	5	1	3	3	2	2	2	2	2	3	5	1
	17.d	2	3	1	2	3	3	3	3	1	4	5	1	3	2	2
	17.e	1	2	2	2	2	2	1	1	2	2	1	1	3	2	1
	18.a	3	2	4	5	5	5	5	3	2	5	4	5	5	4	4
	18.b	3	2	2	2	3	1	2	1	1	2	3	2	2	3	2
	18.c	1	1	1	2	2	2	2	3	1	2		3	4	1	1
	18.d	5	5	5	5	5	5	4	5	5	5	4	5	4	3	2
	18.e	2	4	2	5	1	2	1	3	4	2	2	1	4	5	4
	19.a	2	3	4	5	1	2	3	1	4	5	1	3	2	2	2
	19.b	3	1	1	2	3	1	1	1	2	3	1	1	1	2	3
	19.c	1	1	1	3	4	5	4	1	3	4	3	4	1	2	2
	19.d	1	2	2	3	1	2	1	2	3	1	2	3	1	2	2
	19.e	1	5	3	1	2	4	2	4	3	2	5	2	2	1	3
	20.a	5	5	5	3	5	4	5	5	5	5	5	5	5	4	3
	20.b	2	2	5	4	5	5	4	2	3	1	3	2	3	1	2
	20.c	1	4	1	1	1	2	1	2	4	1	4	2	4	2	1
	20.d	4	4	4	4	3	3	4	4	3	4	3	3	4	4	4
	20.e	3	1	3	4	5	1	2	2	4	5	1	5	2	3	4
	21.a	2	2	2	2	2	2	3	1	2	2	1	5	4	1	3
	21.b	1	2	2	3	2	2	1	2	3	1	2	3	1	2	1
	21.c	1	1	1	2	1	1	1	1	2	1	1	2	2	2	1
	21.d	2	3	4	5	2	3	4	5	4	1	1	2	2	3	1
	21.e	1	2	2	1	1	1	1	1	1	1	1	1	2	2	2

	Respondents															
		R30	R31	R32	R33	R34	R35	R36	R37	R38	R39	R40	R41	R42	R43	R44
Problems	15.a	4	2	2	1	1	2	3	2	4	1	2	2	1	3	2
	15.b	4	1	4	2	3	1	2	1	3	3	1	3	1	4	3
	15.c	4	1	3	2	1	3	3	1	3	3	5	4	5	5	4
	15.d	4	4	5	5	5	4	5	5	5	5	5	5	5	5	5
	15.e	1	5	5	5	5	5	5	5	5	4	2	3	4	3	5
	16.a	2	1	4	1	1	2	1	4	1	2	1	1	4	5	1
	16.b	5	4	1	2	3	4	5	2	5	4	3	1	1	2	4
	16.c	1	2	2	2	2	2	2	2	2	2	2	1	1	1	3
	16.d	4	5	1	2	4	2	5	3	1	1	1	1	2	2	2
	16.e	4	5	2	3	3	4	4	4	5	5	5	5	5	5	5
	17.a	1	5	5	5	5	5	5	4	5	4	5	3	4	4	4
	17.b	3	3	3	2	4	3	4	5	2	3	2	3	4	2	3
	17.c	1	3	2	2	3	1	3	1	1	1	2	2	2	3	5
	17.d	2	1	2	1	2	3	2	3	2	3	2	3	1	2	3
	17.e	1	2	3	1	2	1	2	1	1	2	2	1	2	4	1
	18.a	3	5	5	5	5	5	5	5	5	5	4	3	2	3	5
	18.b	2	1	1	1	1	1	2	3	1	1	1	2	3	2	2
	18.c	2	3	4	5	1	5	1	2	5	4	4	4	5	1	1
	18.d	3	5	5	5	5	5	5	5	5	4	3	4	5	5	5
	18.e	2	4	1	2	1	5	1	3	1	2	2	1	1	1	1
	19.a	1	1	3	2	3	1	2	3	4	3	1	2	5	1	5
	19.b	1	1	4	1	1	2	3	1	1	2	1	1	2	3	1
	19.c	3	1	2	1	2	3	4	5	4	2	5	3	1	2	1
	19.d	1	2	1	3	1	5	4	1	2	3	2	5	2	2	1
	19.e	4	4	1	2	4	1	2	3	1	4	1	1	3	1	2
	20.a	3	2	3	5	4	5	5	5	4	4	5	5	5	4	4
	20.b	3	4	2	3	1	2	3	1	1	2	3	3	4	2	3
	20.c	1	1	1	1	1	1	1	1	1	2	2	2	1	1	2
	20.d	1	4	4	4	3	1	4	3	4	5	1	4	3	4	4
	20.e	2	4	3	1	2	3	4	5	2	3	1	2	1	4	5
	21.a	1	2	1	1	1	1	1	2	3	1	2	4	2	1	3
	21.b	2	3	1	4	5	1	5	4	1	1	2	3	1	2	2
	21.c	1	2	1	1	1	2	1	1	1	1	1	2	2	1	1
	21.d	2	1	1	2	2	1	3	1	1	2	3	1	2	3	2
	21.e	1	2	1	2	2	1	2	3	2	2	1	2	2	1	1

		Respondents															
Problems		R45	R46	R47	R48	R49	R50	R51	R52	R53	R54	R55	R56	R57	R58	R59	
	15.a	1	3	2	5	2	3	4	5	1	1	2	3	1	4	2	
	15.b	4	4	1	4	2	1	4	1	1	4	4	2	2	1	1	
	15.c	4	5	4	4	5	4	4	4	3	3	4	5	4	3	4	
	15.d	2	3	5	4	4	4	5	5	4	2	1	5	4	4	2	
	15.e	4	5	3	5	4	5	4	1	5	4	5	5	5	5	5	
	16.a	4	2	1	3	1	2	1	4	5	1	1	1	2	3	1	
	16.b	4	5	1	5	4	2	1	5	4	2	5	4	1	1	1	
	16.c	1	4	5	2	3	1	1	1	1	2	3	5	3	5	1	
	16.d	1	4	1	2	1	2	3	2	1	3	1	5	5	5	4	
	16.e	5	3	4	4	5	3	5	4	5	3	4	5	5	4	5	
	17.a	4	5	5	5	5	5	3	5	5	5	4	5	5	5	5	
	17.b	1	2	2	3	2	3	2	1	1	2	3	4	3	2	1	
	17.c	1	3	1	2	2	2	2	3	1	1	2	3	2	4	1	
	17.d	2	3	2	3	3	3	2	1	3	2	3	2	3	2	1	
	17.e	2	3	1	1	2	3	1	2	1	2	2	2	2	2	2	
	18.a	5	5	5	5	5	5	5	5	4	5	3	5	5	5	5	
	18.b	2	1	2	2	2	3	1	1	1	1	1	1	1	2	3	
	18.c	2	2	1	3	2	2	2	1	1	3	1	2	2	3	1	
	18.d	3	5	5	5	5	5	4	5	5	5	5	4	5	5	5	
	18.e	2	3	1	1	3	4	3	1	1	1	1	2	3	4	2	
	19.a	4	2	3	2	5	4	2	3	1	2	1	2	2	1	3	
	19.b	2	1	1	1	2	2	2	3	1	2	3	1	1	2	1	
	19.c	3	1	3	1	2	1	2	2	1	2	2	1	2	1	2	
	19.d	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	
	19.e	1	3	1	2	4	2	3	1	2	1	4	1	2	3	2	
	20.a	5	5	5	5	5	4	3	3	5	5	5	5	4	5	1	
	20.b	4	1	3	2	3	4	2	3	2	4	2	3	2	3	1	
	20.c	3	1	1	1	3	1	1	1	1	3	1	1	1	2	1	
	20.d	4	3	4	3	4	4	3	4	5	3	2	4	4	4	5	
	20.e	4	2	3	4	5	2	3	4	5	1	1	2	2	2	3	
	21.a	1	1	1	1	1	1	1	1	2	2	2	2	2	1	2	1
	21.b	2	2	1	2	3	1	2	1	2	3	1	2	1	2	3	
	21.c	2	2	2	1	3	1	2	2	2	1	1	1	1	1	1	
	21.d	1	2	2	2	1	2	3	1	1	1	2	1	2	1	1	
	21.e	2	2	2	2	1	2	1	2	3	1	1	1	3	1	2	

	Respondents															
		R60	R61	R62	R63	R64	R65	R66	R67	R68	R69	R70	R71	R72	R73	R74
Problems	15.a	1	2	3	1	1	1	1	1	5	3	2	1	1	2	3
	15.b	4	1	1	3	1	5	1	2	3	2	1	1	4	4	1
	15.c	5	5	2	5	4	5	5	2	3	5	5	4	4	4	4
	15.d	3	5	4	3	5	5	3	2	2	5	5	4	3	2	1
	15.e	4	5	5	5	4	3	1	5	5	5	5	5	4	5	3
	16.a	1	1	2	1	2	1	1	1	1	2	3	4	1	4	1
	16.b	2	3	1	1	2	4	2	1	1	1	2	3	4	4	5
	16.c	1	2	2	2	2	2	2	1	1	1	2	3	1	2	2
	16.d	1	2	3	4	1	1	2	1	2	1	1	2	4	5	4
	16.e	5	5	5	4	4	5	5	5	1	3	5	3	4	5	4
	17.a	5	5	4	3	4	5	5	1	3	5	5	5	4	3	5
	17.b	3	3	3	3	2	1	2	3	1	2	3	3	3	3	3
	17.c	1	2	3	3	3	2	3	1	4	1	2	2	3	2	2
	17.d	2	3	2	3	1	2	3	2	3	2	1	2	3	1	2
	17.e	2	2	1	1	1	1	2	2	2	1	2	1	2	2	2
	18.a	5	5	5	5	5	4	4	5	5	5	3	4	5	5	5
	18.b	1	2	2	2	2	2	2	1	1	2	3	4	1	4	5
	18.c	1	2	3	1	2	3	1	2	2	1	1	1	2	2	3
	18.d	5	5	5	1	3	5	5	5	5	4	5	5	4	5	5
	18.e	2	2	1	1	1	1	1	1	1	2	3	2	3	4	5
	19.a	4	5	1	2	2	1	2	3	2	2	2	2	2	1	2
	19.b	2	1	1	2	2	1	2	3	1	5	4	1	4	1	2
	19.c	4	1	2	1	1	2	3	1	4	3	1	2	1	3	1
	19.d	1	2	5	1	1	2	4	1	2	4	1	1	3	2	1
	19.e	1	1	1	1	1	1	1	2	3	2	3	1	2	2	2
	20.a	5	3	3	5	4	5	5	5	5	4	5	2	5	5	5
	20.b	2	3	1	1	2	1	4	3	2	1	2	1	3	1	2
	20.c	1	2	2	2	1	3	1	2	1	5	3	1	2	1	1
	20.d	4	5	4	3	5	3	4	3	3	2	5	4	3	3	4
	20.e	4	1	4	2	1	3	4	5	2	1	1	2	2	5	4
	21.a	1	1	3	1	4	1	1	1	2	2	2	1	3	1	2
	21.b	1	2	4	2	1	1	3	1	1	1	1	2	5	3	2
	21.c	1	1	2	1	1	1	1	1	1	2	1	1	2	1	1
	21.d	1	2	3	2	1	2	1	1	2	3	5	2	3	1	2
	21.e	2	2	4	1	1	1	1	2	2	1	1	2	3	1	1

	Respondents															
		R75	R76	R77	R78	R79	R80	R81	R82	R83	R84	R85	R86	R87	R88	R89
Problems	15.a	1	1	2	1	1	1	3	3	1	2	3	1	2	3	1
	15.b	1	2	1	1	2	1	4	1	1	4	4	3	2	1	1
	15.c	5	4	4	5	4	4	5	4	4	5	2	3	4	4	5
	15.d	5	5	4	5	5	5	5	4	4	3	5	4	5	4	5
	15.e	4	5	5	4	1	5	4	5	5	5	5	5	5	5	5
	16.a	2	3	1	1	4	5	1	2	2	1	1	1	1	1	1
	16.b	5	1	2	4	3	1	1	2	3	1	4	5	2	2	1
	16.c	2	2	2	2	1	2	2	2	4	2	1	1	1	3	3
	16.d	2	1	2	1	3	1	1	2	4	5	2	4	3	1	1
	16.e	4	4	3	4	5	5	4	2	3	5	4	5	4	5	4
	17.a	5	5	4	5	5	3	5	2	5	5	5	5	4	5	4
	17.b	2	3	2	1	2	1	1	2	3	3	4	1	1	1	1
	17.c	1	3	1	1	1	1	1	1	1	3	3	4	5	1	1
	17.d	3	2	1	2	3	1	2	3	1	4	5	3	2	3	3
	17.e	2	1	1	1	1	1	2	3	2	1	1	1	1	1	1
	18.a	5	5	5	1	4	5	5	5	5	5	2	5	4	4	4
	18.b	5	1	1	2	3	5	4	4	4	3	3	3	1	2	3
	18.c	3	1	2	2	1	4	4	1	4	2	1	1	2	4	3
	18.d	4	5	5	4	5	5	4	5	5	5	4	3	5	5	5
	18.e	2	3	5	1	2	3	1	2	1	3	1	1	2	1	2
	19.a	3	3	3	3	4	2	5	1	2	1	3	2	1	2	3
	19.b	2	1	1	1	2	3	5	4	2	1	2	4	4	1	2
	19.c	1	2	2	1	2	1	1	2	2	1	1	1	2	3	4
	19.d	2	1	2	3	1	2	1	2	4	1	1	1	1	1	1
	19.e	2	1	3	1	1	1	1	1	1	1	2	1	1	1	2
	20.a	3	3	4	5	5	5	5	5	5	5	5	5	5	4	3
	20.b	1	2	3	1	1	4	1	2	3	4	1	1	2	3	4
	20.c	1	1	2	2	2	3	1	2	1	2	2	2	1	2	1
	20.d	4	5	4	3	3	4	3	4	4	3	5	4	4	3	3
	20.e	4	5	2	3	1	4	5	2	3	1	2	4	5	3	4
	21.a	1	2	2	2	1	2	1	1	1	1	2	2	1	2	1
	21.b	1	4	2	3	1	2	1	3	1	1	2	3	1	2	1
	21.c	1	1	1	1	1	2	1	1	1	1	1	2	1	1	2
	21.d	3	1	2	1	1	3	2	1	1	1	2	3	1	2	4
	21.e	2	2	1	1	1	1	2	2	1	2	3	1	2	1	2

	Respondents															
		R90	R91	R92	R93	R94	R95	R96	R97	R98	R99	R100	R101	R102	R103	R104
Problems	15.a	1	1	1	1	2	3	1	2	4	1	1	3	1	4	2
	15.b	3	2	1	2	2	2	1	1	1	1	1	2	5	3	5
	15.c	2	5	3	4	4	3	5	2	4	5	4	4	4	4	4
	15.d	4	5	5	5	5	4	3	1	2	5	4	5	4	5	2
	15.e	4	3	1	5	5	5	4	4	2	4	5	4	5	5	5
	16.a	1	2	1	3	1	1	2	3	1	1	1	1	1	2	1
	16.b	2	2	4	1	1	2	5	4	3	1	4	5	2	3	3
	16.c	3	1	2	3	3	3	5	1	4	5	2	3	1	1	1
	16.d	4	5	1	4	2	5	1	4	2	4	3	4	1	2	2
	16.e	5	4	2	3	5	5	5	5	5	4	3	1	4	4	3
	17.a	5	5	4	5	5	5	5	4	5	4	5	3	5	5	5
	17.b	2	2	2	2	2	1	2	1	2	3	3	4	5	1	2
	17.c	2	3	1	2	4	4	4	3	4	1	2	2	2	3	1
	17.d	1	3	1	2	3	3	3	2	3	3	2	3	3	2	1
	17.e	1	2	1	2	1	4	2	2	2	1	1	2	3	1	2
	18.a	1	2	5	5	5	4	3	1	5	5	5	5	5	5	4
	18.b	1	1	2	3	2	3	2	1	1	5	1	1	3	3	2
	18.c	5	2	1	2	2	2	2	1	2	3	4	1	2	2	3
	18.d	4	5	3	5	5	5	4	1	5	4	5	5	5	3	3
	18.e	3	4	1	1	1	1	1	1	1	4	5	1	2	2	2
	19.a	1	4	2	3	1	2	2	1	2	3	3	3	3	1	2
	19.b	3	4	1	1	1	1	2	3	4	2	3	1	1	4	1
	19.c	5	2	1	2	3	1	1	2	1	2	2	1	2	3	1
	19.d	1	2	3	1	2	3	1	2	3	2	3	1	2	2	3
	19.e	2	3	1	2	2	1	1	2	1	2	3	1	2	4	3
	20.a	5	5	4	4	5	4	5	5	5	5	5	3	2	3	1
	20.b	1	2	1	3	2	1	2	3	1	4	2	1	2	3	4
	20.c	1	1	1	2	3	1	1	2	1	2	1	1	2	3	4
	20.d	3	4	1	5	3	4	3	5	2	3	3	4	3	4	3
	20.e	5	2	1	1	5	4	5	1	4	2	3	3	1	1	2
	21.a	1	2	2	1	3	3	3	4	1	2	2	1	2	4	2
	21.b	2	3	1	2	3	1	2	3	2	1	2	1	1	4	2
	21.c	1	1	1	1	1	2	1	1	1	1	1	1	1	1	2
	21.d	5	3	2	5	5	4	1	2	3	1	2	5	4	2	1
	21.e	1	2	1	2	3	1	1	1	1	2	1	1	2	1	1

	Respondents															
		R105	R106	R107	R108	R109	R110	R111	R112	R113	R114	R115	R116	R117	R118	R119
Problems	15.a	4	3	2	1	2	3	1	2	1	4	1	1	2	2	2
	15.b	4	2	1	1	2	1	2	1	3	1	4	2	1	1	1
	15.c	5	4	4	3	3	1	3	1	3	3	3	4	5	1	4
	15.d	3	3	4	5	5	5	1	5	4	3	1	5	4	4	3
	15.e	4	5	5	4	5	4	5	4	5	5	4	5	3	1	5
	16.a	1	1	2	3	1	1	2	4	1	1	1	2	3	3	3
	16.b	2	4	1	1	2	3	5	4	4	1	5	1	2	4	4
	16.c	2	2	1	1	2	3	2	3	1	2	2	2	2	1	1
	16.d	2	2	3	1	2	4	5	1	2	2	1	4	5	4	3
	16.e	5	5	5	4	5	3	4	5	4	5	4	4	4	2	5
	17.a	5	5	4	5	5	4	5	5	5	5	4	5	5	5	4
	17.b	3	4	5	1	2	3	4	5	2	1	4	5	2	4	3
	17.c	2	2	1	2	2	3	1	1	2	3	2	3	2	3	2
	17.d	3	2	3	2	1	2	3	2	3	2	1	3	2	3	3
	17.e	3	2	2	2	2	2	2	2	2	2	1	1	1	1	1
	18.a	2	3	5	5	5	5	1	2	5	5	4	5	3	1	4
	18.b	4	1	2	3	2	3	3	1	1	1	2	3	3	2	3
	18.c	1	4	2	2	3	2	1	2	2	2	1	2	3	4	5
	18.d	3	2	2	3	4	5	3	5	4	2	5	3	5	5	5
	18.e	2	2	1	1	3	1	4	1	2	4	2	1	3	5	2
	19.a	1	1	2	3	4	5	3	2	1	4	5	2	1	2	1
	19.b	2	4	3	1	2	3	4	1	2	5	4	3	3	1	2
	19.c	2	1	2	2	2	1	2	2	1	2	1	2	3	1	3
	19.d	1	3	2	1	2	1	1	3	1	1	2	1	2	2	2
	19.e	1	2	3	2	1	4	2	3	2	4	2	1	3	1	2
	20.a	4	5	5	5	4	2	1	5	5	1	5	5	2	5	5
	20.b	2	1	2	3	2	4	2	2	1	2	3	3	2	4	1
	20.c	1	3	1	5	1	3	2	1	2	2	1	3	1	1	2
	20.d	4	4	2	5	5	4	5	4	4	4	3	3	5	3	4
	20.e	2	2	2	1	3	1	1	1	1	1	2	1	2	2	1
	21.a	1	2	3	1	2	1	2	1	1	2	2	3	1	2	3
	21.b	1	2	1	1	2	2	2	2	1	1	1	3	1	2	1
	21.c	2	1	1	2	1	1	1	2	1	2	1	1	1	1	2
	21.d	4	5	4	1	2	5	1	2	3	5	4	2	1	4	2
	21.e	1	1	1	1	1	2	1	1	1	2	1	1	1	2	2

		R120	R121	R122	R123	R124	R125	R126	R127	R128	R129	R130	R131	R132	R133	R134
Problems	15.a	2	2	1	1	3	2	1	2	1	3	1	3	1	3	1
	15.b	2	1	1	1	1	1	2	1	3	2	3	1	1	2	1
	15.c	3	3	5	3	3	2	5	4	5	4	3	5	4	4	4
	15.d	5	5	2	5	4	3	4	4	5	2	5	4	4	4	4
	15.e	4	5	5	5	5	5	4	4	5	5	4	5	4	5	5
	16.a	3	1	4	1	2	2	1	2		2	1	2	1	4	2
	16.b	4	4	4	1	2	2	2	2	2	2	4	1	5	3	2
	16.c	1	1	2	2	1	2	2	4	3	4	1	2	1	2	1
	16.d	2	2	2	2	1	2	3	4	1	4	5	4	2	1	2
	16.e	5	5	5	4	4	4	4	5	5	2	4	2	5	5	5
	17.a	5	5	2	2	5	5	3	5	4	3	5	5	4	5	5
	17.b	2	1	1	2	2	2	1	1	1	2	2	2	2	3	2
	17.c	2	2	1	1	4	4	1	1	1	2	1	2	2	1	3
	17.d	3	3	2	3	3	2	3	3	2	3	1	2	3	2	3
	17.e	1	1	1	1	1	2	1	2	2	2	1	2	2	3	1
	18.a	1	5	5	4	5	5	4	5	2	3	5	4	4	2	3
	18.b	2	2	4	4	5	1	1	2	5	4	1	4	1	2	1
	18.c	1	5	4	1	2	3	1	4	3	2	1	2	4	2	3
	18.d	3	2	5	4	5	5	5	5	5	5	5	5	5	4	5
	18.e	5	3	1	2	1	4	2	3	2	1	1	1	3	1	2
	19.a	1	2	3	4	5	1	2	2	2	2	1	2	2	2	1
	19.b	1	4	5	3	2	1	2	3	1	2	1	2	1	4	5
	19.c	1	1	2	5	1	2	2	2	1	5	2	1	3	4	3
	19.d	1	2	3	1	2	2	3	1	2	1	2	3	1	1	2
	19.e	3	4	2	2	1	2	1	2	4	4	2	2	1	4	1
	20.a	1	5	4	5	5	3	1	5	5	4	5	2	5	5	1
	20.b	3	1	1	2	3	4	5	3	4	3	4	2	2	4	2
	20.c	3	4	1	1	1	1	1	1	1	1	2	3	2	2	1
	20.d	5	4	4	5	4	4	5	3	4	5	4	4	3	4	4
	20.e	2	1	5	4	1	3	1	1	1	2	3	4	1	2	3
	21.a	2	1	2	2	2	1	3	2	1	2	1	2	3	1	2
	21.b	2	4	5	2	2	2	2	1	2	1	1	1	1	1	1
	21.c	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1
	21.d	5	1	3	3	2	3	4	5	3	2	1	3	4	3	2
	21.e	5	1	1	1	2	1	1	1	1	1	2	2	1	1	1

	Respondents															
		R135	R136	R137	R138	R139	R140	R141	R142	R143	R144	R145	R146	R147	R148	R149
Problems	15.a	3	1	2	2	1	1	2	1	4	3	1	2	1	2	1
	15.b	3	1	3	2	3	2	1	1	2	3	2	1	2	2	1
	15.c	5	2	4	1	3	4	2	1	4	5	4	3	4	4	5
	15.d	4	4	5	5	5	5	4	5	5	4	3	5	4	4	5
	15.e	5	5	4	1	3	1	1	1	3	1	5	2	1	1	5
	16.a	4	5	2	1	1	5	1	2	3	2	2	2	2	1	1
	16.b	1	1	2	2	2	3	1	1	3	5	4	2	1	3	1
	16.c	3	2	2	2	2	2	2	3	1	2	1	1	3	1	2
	16.d	3	4	4	2	3	2	4	1	2	2	2	1	1	2	3
	16.e	5	5	2	5	4	5	5	5	4	5	2	4	1	4	5
	17.a	4	5	5	4	5	5	5	4	5	5	5	5	5	4	5
	17.b	3	3	4	4	2	2	1	2	2	3	1	2	1	3	1
	17.c	1	1	2	2	1	3	2	2	1	1	1	2	1	2	2
	17.d	1	2	2	3	1	3	2	1	2	3	3	1	3	2	3
	17.e	2	1	2	2	2	2	2	2	2	2	2	1	2	1	2
	18.a	4	5	5	1	3	3	5	5	4	3	4	5	3	4	3
	18.b	2	3	1	2	3	1	1	2	3	3	2	1	2	2	2
	18.c	1	2	1	2	2	2	2	1	3	1	5	2	3	1	1
	18.d	5	1	5	2	5	4	5	5	5	4	2	3	5	3	5
	18.e	1	3	1	1	1	1	2	1	1	2	3	1	1	2	1
	19.a	3	2	1	5	1	2	3	1	2	3	5	1	2	2	3
	19.b	1	2	3	1	2	1	2	1	4	2	3	4	5	4	1
	19.c	2	1	2	2	2	1	1	1	2	4	1	2	1	1	2
	19.d	1	1	2	1	1	2	3	2	2	2	1	2	1	2	2
	19.e	2	3	4	5	2	2	3	4	1	2	1	2	4	2	3
	20.a	4	1	5	4	2	2	5	1	5	4	5	5	5	4	5
	20.b	3	4	5	1	2	2	4	2	1	3	5	2	4	2	3
	20.c	1	2	2	1	3	1	2	1	1	1	2	2	1	1	1
	20.d	5	3	4	4	2	4	4	4	3	3	4	4	5	4	4
	20.e	1	2	3	1	2	4	5	2	3	4	5	4	1	2	4
	21.a	1	1	1	2	3	3	1	2	3	1	2	3	1	2	3
	21.b	1	2	3	1	1	1	1	1	1	2	1	3	1	2	4
	21.c	1	1	1	1	1	1	2	1	1	1	1	1	2	1	2
	21.d	1	3	4	2	4	1	3	3	3	3	3	3	3	3	2
	21.e	1	1	1	2	1	1	1	2	2	2	1	2	2	1	2

		Respondents														
Problems		R150	R151	R152	R153	R154	R155	R156	R157	R158	R159	R160	R161	R162	R163	R164
	15.a	1	1	1	2	2	2	1	2	2	1	2	1	2	1	1
	15.b	1	1	1	2	2	1	1	1	2	2	1	1	2	1	2
	15.c	4	4	5	4	2	3	4	4	4	1	2	1	3	4	3
	15.d	5	5	4	5	5	5	4	5	5	5	5	5	5	5	5
	15.e	2	1	5	2	5	1	4	1	1	1	3	1	1	1	2
	16.a	3	2	4	1	1	3	1	1	2	1	2	1	2	2	2
	16.b	4	5	2	2	2	3	1	2	4	5	1	2	2	3	4
	16.c	1	2	2	2	1	1	1	1	1	2	1	1	1	1	1
	16.d	1	1	1	2	1	2	4	5	2	2	1	1	1	2	3
	16.e	4	5	5	5	4	4	5	5	1	5	4	5	5	2	5
	17.a	5	5	5	5	4	5	5	5	5	5	5	5	5	5	5
	17.b	1	1	1	1	1	3	2	3	1	3	3	3	1	1	4
	17.c	3	1	1	2	3	2	3	1	1	2	2	3	1	2	1
	17.d	3	3	3	3	2	1	1	3	3	3	3	3	2	2	2
	17.e	2	1	2	3	1	3	1	2	2	1	3	1	2	4	5
	18.a	5	5	5	5	5	3	5	4	4	5	5	4	5	5	5
	18.b	2	1	1	1	1	2	5	1	2	2	2	2	1	2	2
	18.c	2	2	2	1	1	2	2	1	2	2	3	1	4	1	2
	18.d	3	5	1	5	3	5	1	5	5	5	1	5	1	4	5
	18.e	3	2	2	2	1	2	1	1	2	1	1	1	1	1	1
	19.a	2	3	1	4	5	1	2	2	3	1	2	5	1	2	3
	19.b	2	5	3	5	4	1	2	3	2	4	4	1	5	2	1
	19.c	2	1	2	2	1	1	1	2	1	1	1	2	1	2	2
	19.d	1	1	2	1	1	1	1	2	1	2	1	2	1	2	1
	19.e	1	2	1	1	2	1	5	3	2	1	2	2	1	3	4
	20.a	5	5	5	5	5	5	5	4	5	5	5	5	5	1	5
	20.b	2	4	2	3	5	4	1	4	4	5	1	2	4	3	2
	20.c	2	1	1	3	2	1	2	1	2	2	2	2	2	2	2
	20.d	2	3	4	4	4	2	4	1	4	4	1	5	4	1	4
	20.e	3	4	2	1	5	4	2	1	3	2	3	2	3	3	3
	21.a	1	2	3	1	2	2	1	2	1	2	2	2	1	1	2
	21.b	1	1	1	1	2	2	3	1	2	1	2	1	3	3	2
	21.c	1	2	1	1	2	1	2	1	1	1	1	2	2	1	1
	21.d	2	2	3	1	3	2	4	5	3	2	1	1	4	5	3
	21.e	1	2	2	1	2	1	1	1	1	2	2	1	2	1	2

Respondents				Total	Average
Problems		R165	R166		
	15.a	3	1	322	0.388
	15.b	1	1	328	0.395
	15.c	3	1	615	0.741
	15.d	5	5	700	0.843
	15.e	5	5	659	0.794
				0	-
	16.a	3	1	312	0.376
	16.b	2	2	452	0.545
	16.c	1	1	339	0.408
	16.d	1	2	412	0.496
	16.e	5	5	685	0.825
				0	-
	17.a	5	5	750	0.904
	17.b	3	2	393	0.473
	17.c	2	1	346	0.417
	17.d	2	3	390	0.470
	17.e	1	1	287	0.346
				0	-
	18.a	5	5	692	0.834
	18.b	3	1	348	0.419
	18.c	4	1	358	0.431
	18.d	5	5	711	0.857
	18.e	2	1	335	0.404
				0	-
	19.a	4	5	400	0.482
	19.b	3	4	368	0.443
	19.c	1	1	328	0.395
	19.d	1	2	291	0.351
	19.e	5	5	362	0.436
				0	-
	20.a	5	5	707	0.852
	20.b	2	3	419	0.505
	20.c	1	2	276	0.333
	20.d	4	4	608	0.733
	20.e	3	3	449	0.541
				0	-
	21.a	1	2	302	0.364
	21.b	2	2	316	0.381
	21.c	2	2	211	0.254
	21.d	2	1	411	0.495
21.e	2	3	248	0.299	