

5.2.3

Social Conditions

Regional Setting

The social survey was carried out in the municipality of Arraias, in the State of Tocantins, and in the municipality of Campos Belos, in the State of Goiás. The main results are presented below.

5.2.3.1

Arraias – State of Tocantins / TO

Creation of the City of Arraias

The history of Arraias began in the Gold Rush. In the mid-eighteenth century, a Jesuit Mission settled near the city's current location, forming a village called Boqueirão dos Tapuios. The first black people coming from destroyed *quilombos* started to arrive in the region, occupying a place known as Chapada dos Negros. Thereafter, Arraial da Chapada dos Negros was founded. The Governor of the Province of São Paulo, D. Luís de Mascarenhas, personally came to take possession of the auriferous veins of the region in 1740. With the aid of Captain Felipe Antônio Cardoso and the slaves, he transferred the seat of Arraial da Chapada dos Negros to the place currently occupied by the city of Arraias. The city of Arraias was created only in 1914.

The name originates from the former denomination of Tocantins River – Iabebéri River, or River of *arraias* [stingrays]. When Judge Joaquim Theotônio Segurado was told that Captain Felipe Antônio Cardoso, his opponent, had founded a village near Chapada dos Negros and that he still had not given it a name, he ironically sent him a bunch of stingrays.

The city of Arraias is known as the “city of the hills” for its mountainous territory. Its architecture is marked by the Portuguese colonial style. In the oldest houses one can find the initials of patriarchs of the families that built them, as well as the year in which they were built.

Infrastructure

Infrastructure is here understood as the set of activities and structures of the economy that serve as the basis for developing other activities. It includes highways, hydropower plants, ports, airports, bus stations, telecommunication systems, railways, water distribution systems, sewage and solid waste treatment, power transmission systems etc.

Infrastructure is a key-element for economic development. When there is no infrastructure, companies are not able to properly develop their business activities. When a country has an underdeveloped infrastructure, products may become more expensive in the domestic market (adversely affecting consumers) and in the foreign market (hindering exports due to international competition).

The basic infrastructure conditions of the city of Arraias are presented below in relation to: population, sanitation, pavement, communication, transportation, energy, health, education, leisure and tourism, government structure, non-governmental organizations and economic activities.

Studies, estimates and diagnosis, will be updated during the development of the Social Infrastructure Program based on collected data.

Demography and Population Dynamics

A basic concern in the study of human populations is its size at a given time and the possible phenomena that determine or affect it, such as birth, death and migration. The study of population composition by age and sex is also of fundamental importance due to its repercussion on social and economical phenomena.

The city of Arraias comprises a territory of 5,786 km². According to the latest population count carried out by IBGE (2010) in 2007, the city's population totaled 10,626 inhabitants.

Based on the data presented in **Table 5.2.3.1.a**, it is possible to observe that, from 2000 to 2007, there was a decrease of approximately -0.47% in the annual geometrical growth rate of the population of Arraias. Such result might be a reflection of the problems which the city has gone through, with the population migration to other locations providing better living and working conditions. However, such decrease reflects in the tax collections and leads to a lower share in the Participation Fund (FPM) and in the incentive policies directed by the Federal and State Government to the Municipalities and, as a result, there is a lower cash flow, no attraction of investments etc. The population that remains in the city is the most affected, a fact proven in the environmental perception research carried out in Arraias. Job opportunities are the main complaint of respondents.

Table 5.2.3.1.a
Demographic data of Arraias

City	Total Population		Annual Geometric Growth Rate (% a,a)		Demographic Density (inhabitants/km ²)	Urbanization rate (%)
	2000	2007	1996/2000	2000/2007		
Arraias	10,984	10,626	-0,66	-0,47	2,0	57,7

Source: IBGE, 2010 – Demographic Census 2000 / Population Count 2007.

The demographic density of the city is only 2 inhabitants per square kilometer; the state average is 4.8; the regional average is 3.31. The urbanization rate is 57.7%, that is, almost half of the population that still lives in the rural area of Arraias. Gradually, the abandonment of rural areas by municipal administrations has affected Arraias. This hinders the access to such regions, mainly reflected in the bad conditions of the roads and poor infrastructure, causing migration to the urban area in search for a better quality of life.

Negative rates of population growth in Arraias are alarming. In the periods analyzed the population index has suffered a significant decline, although there was a slight improvement in the period between 2000/2007. Local authorities have difficulties reversing this scenario as the municipal budget is very limited. The daily challenge of municipal managers lies in balancing public needs – basically understood as the provision of public services - and tight budgets, within the plurality of legal standards and the overall objective of population welfare.

With respect to the male and female contingents, it is observed that the male index in the rural area is more significant and represents 55.7% of the rural population and, the female is more representative in the urban area with the percentage of 51.7% (**Table 5.2.3.1.b**).

Table 5.2.3.1.b
Residents by sex and domicile status

City	Urban Population		Urban Population	
	Female	Male	Female	Male
Arraias	3,173	2,963	2,150	2,698

Source: IBGE, 2010 – 2000 Demographic Census Sample Results.

With respect to the population distribution by age group, according to data presented in **Table 5.2.3.1.c**, there is equivalence between the young population (up to 17 years old) and the economically active adult population, 20 to 59 years of age. This last represents 46% of the population, being very close to the number of youngsters, from 0 and 17 years of age, which is 45%. These data provide both current and future information, regarding the potential workforce, planning and investments in structures to serve the basic needs of the general population, which may be used by private and public companies that intend to invest or settle in the city.

Table 5.2.3.1.c
Population of Arraias by age group

Age Group (years)	Arraias/To Population
0 to 3	984
4	274
5 to 6	557
7 to 9	864
10 to 14	1,478
15 to 17	786

Age Group (years)	Arraias/To Population
18 to 19	394
20 to 24	887
25 to 29	710
30 to 39	1,287
40 to 49	1,034
50 to 59	771
60 to 64	293
65 to 69	228
70 to 74	178
75 to 79	80
80 or older	179
TOTAL	10,984

Source: IBGE, 2000 – 2000 Demographic Census Sample Results.

Migration Flow

The migration movement in the city of Arraias shows a gender variation. When it occurs from another federation unit to the state, there is male predominance. When it occurs within the state itself, there is equivalence between genders (**Table 5.2.3.1.d**).

Table 5.2.3.1.d
Migration flow in the city of Arraias - 1996

City	Other State (%)		Same State (%)	
	Man	Woman	Man	Woman
Arraias	410	178	144	110

Source: IBGE, 2010.

The male predominance in the migration flow between the States may be related to the search by men of better job opportunities.

Another fact of migration flow which was verified in field research, concerns the motivation of rural migration to the city. Migrant population headed to the city, seeking for a better quality of life related to education, health and other services that could significantly improve their lives.

To complement this survey, the Social Infrastructure Program has planned an Influx Management study to estimate the impact of the new Project on population growth in the city of Arraias-TO and Campos Belos-GO, as indicated in Section 7.3. It will consider measures to address potential overloading of infrastructure and services.

Quality of Life

Under the 1988 Federal Constitution the Brazilian territory has undergone significant fragmentation. The appearance of a large number of small cities has greatly increased demand for basic public services to the population. The municipalization of health services and education, administrative decentralization and the fiscal responsibility law have complicated local management. This, combined with low tax collection and mismatch of transferes for municipal services, has had a strong impact on small cities with fragile economies.

Ethical, environmental and human completeness standards suggest a new set of indicators that measure, in an integrated way, individual welfare, environmental balance and economic development. The “quality of life” concept is the foundation of this set of indicators, understood as a right to citizenship (FERREIRA, 1996). It refers to a movement within the human and biological sciences which values parameters that are broader than symptom control, reduced mortality or increased life expectancy.

Family income, education, healthcare, and sanitation are usual quality of life parameters. However, one must pay attention to the fact that they are relative and undergo variations from one society to another. Their prudent use allows the calculation of quality of life indicators of the population.

In order to investigate issues related to quality of life parameters of residents of Arraias, the HDI – Human Development Index, prepared by the United Nations Development Programme – UNDP was utilized. In Brazil, the HDI is calculated in conjunction with the Institute of Applied Economic Research - IPEA.

Table 5.2.3.1.e. below presents the HDI calculated for the city of Arraias, comparing it with the state of Tocantins in 1991 and 2000. As can be seen, even though there has been a considerable progress in all dimensions in Arraias from 1991 to 2000, even if there were improvements in 2000, the Municipal Human Development Index – M-HDI of the city remained at levels lower than the state of Tocantins. In any case, it can also be seen that the progress achieved in Arraias in this intercensal period was at rates higher than those observed in the entire state, in the various dimensions of the research, which increased the M-HDI of Arraias.

Table 5.2.3.1.e
Municipal Human Development Index of Arraias

HDI	Years	Arraias	State
M-HDI	1991	0.563	0.611
	2000	0.685	0.710
HDI - Income	1991	0.552	0.580
	2000	0.594	0.633
HDI - Longevity	1991	0.593	0.589
	2000	0.713	0.671
HDI - Education	1991	0.543	0.665
	2000	0.747	0.826

The dimension that most contributed to the increase of Arraias' HDI between 1991 and 2000 was Education, increasing from 0.543 to 0.747 in the period, followed by the improvement of Longevity, from 0.593 to 0.713 and a slight increase in Income, from 0.552 to 0.594. For the state, similar to what happened to Arraias, the dimension that most improved was Education, followed by Longevity and Income.

In 2000, the Municipal Human Development Index of Arraias was 0.685. According to the UNDP's classification, the city is among the regions considered to have an average human development (HDI between 0.5 and 0.8). Compared to other Brazilian cities, Arraias presents an intermediate situation: it is ranked 3225th, considering that 3,224 cities (58.5%) are in a better situation and 2,282 (41.5%) are in a worse or equivalent situation.

Compared to other cities of the state, Arraias is in a good situation: it is ranked 43rd, considering that 42 cities (30.25%) are in a better situation and 96 cities (69.8%) are in a worse or equivalent situation. It is paradoxical to verify certain contradiction in the distribution of these data. Although the city is in an intermediary position for UNDP, according to its MHDI, Arraias presents low rates for employment, education and income distribution, aspects that are relevant for creating a virtuous cycle of human development.

Sanitation

Sanitation is a comprehensive concept including many dimensions as referred to in Heller (1994), who conceives it as a complete water cycle: in its distribution, frequency and quality; in its sewage and sanitary treatment and in the collection and disposal of solid waste. Sanitation is a complex matter in health policy. It correlates dependent and intervenient variables of tenuous permeabilization, in an intersectorial analysis of management and financing of health, education and urbanization.

Approximately 90% of the population has access to potable water in Brazil, a proportion that is similar to countries with high Human Development Index (HDI), such as South Korea (92%) and Cuba (91%). However, for the collection of sewage, Brazil presents a 75% service rate, lower than Paraguay (80%) and Mexico (79%). Nevertheless both indexes improved between 1990 and 2004, according to the Human Development Report (HDR) of 2006.

Water treatment

Besides being vital for life, water treatment creates value in preventing illnesses; it facilitates health and welfare habits, the rational use of water resources and also promotes comfort and safety. As a socio-economic indicator it is related to hygiene and municipal management capability.

The access to treated water is fundamental for the improvement of health and hygiene conditions. Associated with other environmental and socio-economic conditions, related to health, education and income, it is a universal indicator of sustainable development.

In the city of Arraias, water is supplied by Companhia de Saneamento do Tocantins (SANEATINS). The collection is carried out directly from the stream Dois Irmãos, in the Sub-basin of Arraias River, which will not be affected by the activities of the proposed Project. The water treatment station is in operation since 1998 and its current treatment capacity totals approximately 1,600 m³/day. The treatment is based on flotation and disinfection with chlorine. The storage and distribution reservoir supports 350,000 liters.

Table 5.2.3.1.f below shows how water was distributed to residences in the city of Arraias in 2000. It is possible to observe that in 2000, 96.5% of the urban residences were supplied by the general or public water system, indicating that the city is within the indicators of countries with high human development indexes. But this could not be observed in the rural area, as 88.9% of residences are supplied by water coming from wells, which are mostly shallow and springs and the quality of the water can be unsatisfactory as they do not go through any treatment system.

Table 5.2.3.1.f
Permanent private residences by type of water supply in 2000

	No. OF RESIDENCES	MEANS OF SUPPLY		Other means
		General System	Well or Spring	
Urban Area	1,558	1,504	20	34
Rural Area	1,182	114	1,052	16
TOTAL	2,740	1,618	1,072	50

Source: IBGE, 2010

Sanitary Sewer

Sewage treatment aims at avoiding contact between waste with high contamination power and the population through watercourses.

Table 5.2.3.1.g shows number of households according to types of disposal found in the city of Arraias in 2000. One can notice that the situation of the sanitary sewer in Arraias is alarming because both the rural and urban areas have no sewage treatment and the waste is disposed in rudimentary septic tanks that, in almost all cases, are not properly kept. In some households, the waste is disposed directly on the soil, with no treatment whatsoever, creating risks of contamination of the soil and water table. The situation is even more critical in the rural area because waste can be disposed anywhere with no criteria or proper treatment.

Table 5.2.3.1.g
Permanent private residences by type of sanitary sewer in 2000

	No. of households	Means of Sanitary Sewer					Others
		General Sewer System	Septic tank	Rudimentary tank	Ditch	River, lakes	
Urban Area	1.281	5	24	1.237	7	4	4
Rural Area	203	1	23	104	9	23	43
TOTAL	1.484	6	47	1.341	16	27	47

Source: IBGE, 2010

Solid Waste

Whenever domestic solid waste is poorly stored, it poses risk to the population and the environment, so it is essential that their final destinations are landfills. This prevents the proliferation of disease-transmitting vectors.

In Arraias, the collection of waste is carried out by the municipal government, through open trucks. Such waste is disposed in an open-air dump, so it is further burnt or covered by earth. According to local inhabitants, eighteen kilometers from the entrance of the city there is a landfill that was built 10 years ago and that was never operated.

Data presented in **Table 5.2.3.1.h** show indexes related to the collection of waste in 2000 in the city of Arraias. Three items stand out in the urban area: the first one is the waste collected, 58.8%, revealing the precariousness of the municipal service to the population; followed by waste that is burnt, 22.65%, and waste disposed in wasteland or commonland, 17.13%. They reveal deficiencies in municipal administration and risks to the population and environment.

Table 5.2.3.1.h
Residences by situation and destination of domestic waste in 2000

MEANS OF DOMESTIC WASTE DESTINATION							
	No. of residences	Collected*	Burnt	Buried	Wasteland or common land	Rivers, lakes	Other destination
Urban Zone	1,558	917	353	5	267	11	5
Rural Zone	1,182	2		20	389		6
TOTAL	2,740	919	1.118	25	656	11	11

Source: IBGE, 2010 - * Collected and disposed in the dump

Asphalt paving

The city has approximately 60% of its road system covered with asphalt paving or cobblestones (blocks). Several neighborhoods in expansion, located in the suburbs have no paved streets yet.

Communication

The city of Arraias receives TV signals from three television networks - Globo, Bandeirantes and SBT – through a transmission tower installed in the city. Most residences have parabolic antennas, although the signal is not satisfactory according to residents. The fixed telecom service is operated by Oi Brasil Telecom and the mobile telecom by three companies – Oi Brasil Telecom, TIM and Vivo.

The following newspapers are distributed in the city: Jornal do Tocantins; Jornal o Popular; Folha do Sudeste; Jornal Eco do Sudeste and Jornal Folha da Cidade.

The bank network has three institutions, but only Banco do Brasil operates directly. Caixa Econômica Federal operates through “Caixa Aqui” in lottery kiosks and Bradesco through “Banco Postal” in post offices.

Transportation

Road access to the city of Arraias is only by the State Highway TO-050. Arraias has also an unpaved runway and a bus station, located at Rua Dr. Joaquim Magalhães Filho, from where state and interstate buses arrive and depart. The city of Arraias is served by the following transportation companies: Real Expresso, Expresso São José do Tocantins, Expresso União, Expresso Atual and Viação Paraíso.

Energy

Arraias is served by Companhia de Energia Elétrica do Tocantins – CELTINS which has an office and an electrical substation in the city.



According to the census taken in 2000 by IBGE (2010), there were 2,460 residences with electric lighting in Arraias (**Table 5.2.3.1.i**) and, out of those, 58.9% were in the urban area and 41.1% in the rural area.

Table 5.2.3.1.i
Private residences with electrical lighting in 2000

	N. of Residences
Urban	1,449
Rural	1,011
Total	2,460

Source: IBGE (2000)

Health

The health conditions of a city's population are closely related to the general socio-economic development of the region. The World Health Organization (WHO) defines health as a "state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". According to that, the WHO considers the access to a health system a fundamental right of all human beings.

Apart from the study that has already been carried out, the Social Infrastructure Program has planned a complementary survey of health aspects in the municipalities. More data about health conditions will be provided, such as the quantity of hospital beds and admissions for each medical specialty, first DAI units and procedures and state and/or federal transfers for the health in the cities. It shall also include a data survey on HIV/AIDS, with the number of cases of dengue fever and other epidemics.

In addition, another study will be carried out to calculate the estimated use of health services in both cities in order to verify the possible impacts of the future Project on this specific area.

The conditions of the health sector in the city of Arraias are presented below.

Structure of Services provided to the Population

According to the data presented in **Table 5.2.3.1.j**, the hospital network in Arraias has 57 hospital beds, totaling an average of 5.22 beds for each group of one thousand inhabitants, slightly higher than WHO standards, which is 5 beds for each group of one thousand inhabitants.

It is worth to point out that Arraia's hospital network, in addition to serving the local population, serves the population of the neighboring cities.

Table 5.2.3.1.j
Health facilities by type and availability of beds – 2009

Type of Facility	Quantity	Beds
Health Center/Basic Health Unit	2	4
General Hospital	1	53
Support to Diagnosis and Therapy Service Unit	1	0
Health Surveillance Unit	1	0
TOTAL	5	57

Source: Ministry of Health, 2010 – DATASUS: Data referring to Dec/2009

Table 5.2.3.1.k brings information related to the distribution of hospital facilities in Arraias according to the administrative sector. It is observed that the municipal administration is responsible for a greater number of health facilities.

Table 5.2.3.1.k
Health facilities by administrative sector

Arraias –TO	
Administrative Sector	Quantity
State	1
Municipal	3
Private	1
TOTAL	5

Source: Ministry of Health - DATASUS - Dec/ 2009

According to standards set by the WHO, each group of 10,000 inhabitants requires 8 doctors, 2 dentists, 4.5 nurses and 14.5 nursing assistants.

According to data presented in **Table 5.2.3.1.i**, in 2010, the city of Arraias was far above average, since it had 44 doctors for a population of 10,913 inhabitants, but it was a little precarious concerning the distribution of these professionals by specialty. The city has a high proportion of children and elderly and has no professionals specialized in geriatrics and pediatrics.

Table 5.2.3.1.i
Quantity of professionals by specialty

Specialty	Total	Professional/1,000 Inhabitants	Professional SUS/1,000 Inhabitants
Physicians	44	4.0	4.0
Anesthetist	10	0.9	0.9
General Surgeon	8	0.7	0.7
General Practitioner	15	1.4	1.4
Obstetrician Gynecologist	4	0.4	0.4
Family Doctor	2	0.2	0.2
Pediatrician	-	-	-
Psychiatrist	-	-	-
Radiologist	3	0.3	0.3
Dentist	2	0.2	0.2
Nurse	10	0.9	0.9
Physiotherapist	2	0.2	0.2

Specialty	Total	Professional/1,000 Inhabitants	Professional SUS/1,000 Inhabitants
Phonoaudiologist	1	0.1	0.1
Nutritionist	2	0.2	0.2
Pharmacist	3	0.3	0.3
Social worker	3	0.3	0.3
Psychologist	3	0.3	0.3
Nursing Assistant	34	3.1	3.1
Nursing Technician	31	2.8	2.8

Source: CNES. Situation of the national database on Oct 04, 2010.

Hospital Morbidity

Table 5.2.3.1.m presents the hospital admissions per causes and age group in the city of Arraias. According to the data presented, the greatest number of admissions in this period was due to pregnancy, delivery and puerperium, reaching a percentage of 28.1%. In this case, data that draws attention is of women from 15 to 19 years old, who need this type of service, which evidences a very high rate of teenage pregnancy.

Respiratory system diseases accounted for 19.3% of the number of admissions and affected mostly children and the elderly, being more intense between June and September, when the relative humidity is lower and the weather is drier, according to the sub-section Climatology, in the physical environment diagnosis.

Infectious and parasitic diseases ranked 3rd in comparison with the number of admissions, at a percentage of 11.2%, and were more frequent in children from 1 to 4 years old, a fact that can be related to the city's precarious sanitation system. Other causes that draw attention were admissions due to circulatory system diseases, with 10.4%, which affects population from 50 to 60 years old.

Table 5.2.3.1.m
Hospital morbidity by age-group in Arraias

Group of Causes	Age Group								
	< 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	Total
I. Infectious and parasitic diseases	33.3	29.6	24.4	14.3	3.2	4.8	9.6	13.7	11.2
II. Neoplasias (tumors)	1.7	1.0	2.4	2.4	0.8	3.2	4.3	5.2	2.4
III. Blood Diseases haematopoetic organ and immune disorders	1.7	1.0	7.3	2.4	0.8	1.3	2.6	2.6	1.0
IV. Endocrine nutritional and metabolic diseases	1.7	1.0	2.4	2.4	0.8	1.9	3.5	3.3	1.4
V. Mental and behavioral disorders	1.7	1.0	2.4	2.4	0.8	2.3	2.6	2.6	0.9
VI. Nervous system diseases	1.7	2.0	2.4	2.4	0.8	1.3	2.6	2.6	0.9
VII. Eye and related diseases	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.1
VIII. Ear and mastoid apophysis diseases	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.1
IX. Circulatory system diseases	1.7	1.0	2.4	2.4	0.8	4.2	36.5	34.0	10.4
X. Respiratory system diseases	36.7	53.1	26.8	33.3	15.1	9.2	16.5	21.6	19.3
XI. Digestive system disease	1.7	3.1	2.4	2.4	3.2	4.6	7.8	7.8	4.8
XII. Skin and subcutaneous tissue diseases	3.3	1.0	2.4	2.4	0.8	1.9	2.6	2.6	1.3
XIII. Musculoskeletal system and connective tissue diseases	3.3	1.0	2.4	4.8	1.6	3.4	4.3	2.6	2.7
XIV. Genitourinary system diseases	1.7	8.2	9.8	19.0	5.6	10.3	7.0	5.2	8.2

Group of Causes	Age Group								Total
	< 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	
XV. Pregnancy, childbirth and puerperium	1.7	1.0	2.4	2.4	65.1	48.1	2.6	2.6	28.1
XVI. Certain conditions originating in the perinatal period	13.3	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.8
XVII. Congenital malformations, deformations and chromosomal abnormalities	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.3
XVIII. Symptoms, signs and abnormal clinical and laboratory tests	1.7	1.0	2.4	2.4	0.8	1.5	2.6	2.6	0.6
XIX. Injuries, poisoning and certain other consequences of external causes	5.0	1.0	19.5	16.7	3.2	5.3	7.0	6.5	5.8
XX. External causes of morbidity and mortality	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.1
XXI. Contacts with health services	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.1
ICD 10 th revision unavailable or in blank	1.7	1.0	2.4	2.4	0.8	1.3	2.6	2.6	0.1
Total	100.0								

Source: Ministry of Health - DATASUS (SIH/SUS) - Dec/ 2009

Mortality

The mortality rate is considered one of the most important social indicators that allow the evaluation of life conditions of the population in a particular place. Overall, the worse the life conditions, the higher the mortality rate and the lower the life expectancy, which can interfere in the development of the city.

Table 5.2.3.1.n presents the mortality rate by age group in the city of Arraias in 2008. Illnesses of the circulatory system, which specially include infarctions and strokes, were the ones that caused most deaths, with 26.8%. Other defined causes have the same percentage; both affected more the population from 50 to 65 years old. External causes for morbidity and mortality represented 25% of deaths and were more frequently observed in the 20 to 49 age bracket.

Table 5.2.3.1.n
Mortality by group of causes in Arraias in 2008 (in %)

Group of Causes	< 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	Total
I. Infectious and Parasitic Diseases	-	-	-	-	-	-	-	11.5	5.4
II. Neoplasias (tumors)	-	-	-	100	-	-	11.1	3.8	5.4
IX. Circulatory system diseases	-	-	-	-	-	-	33.3	46.2	26.8
X. Respiratory system diseases	-	-	-	-	-	-	11.1	7.7	5.4
XVI. Certain conditions originating in the perinatal period	100	-	-	-	-	-	-	-	5.4
XX. External causes of morbidity and mortality	-	-	100	-	100	75	11.2	3.9	25
Other defined causes	-	100	-	-	-	25	33.3	26.9	26.8
Total	100								

Source: SIM. Situation of the national database on 2009 Note: Data from 2008 are preliminary.

According to **Table 5.2.3.1.o**, the causes for mortality in Arraias in 2008 remained the same as the previous years (2002 to 2007), with little quantitative variation among the years evaluated. Although Arraias is a countryside city, in 2008, it registered as the main cause for mortality, traffic accidents, followed by deaths caused by cerebrovascular diseases, myocardial infarction and aggressions, which prevailed up to 2007.

Table 5.2.3.1.o
Mortality coefficient

DEATH CAUSE	2002	2003	2004	2005	2006	2007	2008
AIDS	-	-	-	-	-	-	-
Malignant neoplasm of breast (/100,000 women)	-	-	18.8	-	-	37.7	-
Malignant neoplasia of the uterine cervix (/100,000 women)	-	18.8	-	-	-	-	-
Acute myocardial infarction	27.3	18.2	18.2	18.2	100.4	36.5	27.5
Cerebrovascular diseases	45.5	72.9	27.3	18.2	54.8	54.8	45.8
Diabetes mellitus	9.1	18.2	-	-	18.3	-	18.3
Transport accidents	-	9.1	18.2	9.1	-	36.5	73.2
Aggressions	45.5	9.1	9.1	-	-	18.3	27.5

Source: SIM, 2010. Situation of the national database on 2009 Note: Data from 2008 are preliminary.

The infant mortality in Arraias, presented in **Table 5.2.3.1.p**, is above the Brazilian average, that is, 16.9 deaths per one thousand live births and also above the average accepted by the World Health Organization, which corresponds to 10 deaths for each 1,000 inhabitants.

Table 5.2.3.1.p
Other mortality indicators

OTHER INDICATORS OF MORTALITY	2002	2003	2004	2005	2006	2007	2008
No. of deaths per 1,000 inhabitants	4.6	4.9	5.0	3.4	4.9	5.6	5.5
Total infant deaths	5	2	2	5	9	1	4
No. of infant deaths for undefined causes	-	-	-	-	-	1	1
% of infant deaths within total deaths ¹	10.0	3.7	3.6	13.5	16.7	1.6	6.7
No. of infant deaths for undefined causes	-	-	-	-	-	100	25.0
Infant mortality per 1,000 live births **	24.8	9.9	9.1	20.4	40.7	5.2	20.5
Total deaths	50	54	55	37	54	61	60

Source: SIM, 2010. Situation of the national database on 2009

Note: Data from 2008 are preliminary.

* Proportional infant mortality coefficient

**considering only the deaths and births collected by SIM/SINASC

Education

For Thomas *et al.* (2002), the main asset of most poor people is their human capital, and investing in it is primordial to correct inequality and reduce poverty. It can be achieved with investment in good quality education.

Currently, people considered to be literate are those who can read and write a little message in the language of their country, and those who are capable of using grammar and its variations only by writing their name are considered functional illiterate. In terms of education, Arraias does not present good indexes. According to data presented in **Table 5.2.3.1.q**, the literacy rate in the city of Arraias was 75.60%, which is considered good, but not satisfactory, as it is below the national average (86.37%). For these rates, the population above 10 years old was considered in the different levels of education.

To analyze the possible future scenarios of this area of the municipality, a supplementary study will be carried out within the Social Infrastructure Program, which will present new data about education in the city of Arraias, such as: education rate by teaching level and level of education of the adult population.

Table 5.2.3.1.q
Level of education in the city of Arraias – 2000 - – Literacy rate

Population	Literate Population	Illiterate Population	Literacy rate (%)
10,984	8,305	2,679	75,60

Source: IBGE (2000)

According to data presented in **Table 5.2.3.1.r**, the share of the population that has a highest level of education is the one with 20 years old or more.

Table 5.2.3.1.r
Literacy rate of the population above 10 years old

City	Age-Groups	Literate People	Literacy Rate
Arraias	10 to 14	1,478	21,70
	15 to 19	1,180	17,68
	20 or older	5,647	60,62
Total		8,305	100

Source: IBGE (2000)

Arraias has education facilities in the municipal and state spheres and also private schools. It has also a campus of Universidade Federal do Tocantins and a State Technical School. In **Table 5.2.3.1.s** the city appears with the highest number of schools, totaling 58 nursery schools and elementary schools. In the state, even with the greatest number of students enrolled in Elementary and High School, there are only 10 schools. The private sector accounts for only 3 school establishments in the city.

Table 5.2.3.1.s
Quantity of school establishments

Education Levels	Municipal	State	Private
Nursery School	25	0	2
Elementary School	33	7	1
High School	0	3	0
TOTAL	58	10	3

Source: Ministry of Education/National Institute of Educational Studies and Researches – INEP, 2010 – School Census 2009.

The Campus of Universidade Federal do Tocantins – UFT is located in Arraias, serving various cities of the South region of the state, developing researches in technology and education, geometry of sub-varieties, public policies and biophysics. In this Campus there are classroom and distance learning courses: Teaching Degree in Pedagogy, Mathematics, Teacher Qualification, distance learning course with Teaching Degree in Biology.

The Technical Agricultural School of Arraias serves the local and regional population of the states of Tocantins and Goiás. It offers the Agricultural Technician course. With the system of boarding school or semi-boarding school, its student body is composed by 250 students, most of them being sons of little farmers of the region.

In the city of Arraias, according to the School Census of 2009 (**Table 5.2.3.1.t**), the greatest number of enrollments was registered in Elementary School with 2,371 enrolled students, most of them (73.4%) in state schools, surely the students from the 6th to the 9th year because from the 1st to the 5th year they are responsibility of the city, comprehending the students from the urban and rural areas. According to the data presented, from the total enrolled students, 68.04% are in state schools.

Table 5.2.3.1.t
Number of enrollments by establishment and education method

Establishments	Nursery School	Elementary School	High School	EJA*	Special Education	TOTAL
Municipal	346	558 1,740	0	123	0	1027
Estate	0	73	519	122	29	2410
Private	32	2,371	0	0	0	105
TOTAL	378		519	245	29	3542

Source: Ministry of Education/National Institute of Educational Studies and Researches – INEP, 2010 – School Census 2009. *Young and Adult Education

Public Safety

To monitor public safety conditions, a survey will be carried out on the theme within the Social Infrastructure Program. In addition, this program currently includes a Public Safety Subprogram and a Socioeconomic Monitoring Subprogram. These subprograms will take into consideration themes such as prostitution, domestic violence, alcoholism, use of narcotics and criminality.

These Subprograms will be important aiming to accompany the potential negative impacts of the Project on this area.

Leisure and Tourism

Tocantins, for being a state with history of colonial occupation and for having the biomes Amazonia and Cerrado, is a State with great tourism potential that is little explored yet.

Arraias, city created in the golden and colonial period of Brazil, is rich in historic and cultural heritage. The city is surrounded by mountain ranges, with a great number of waterfalls and ruins. It has a great and unexplored tourism potential, especially due to the lack of infrastructure (hotels, inns, restaurants, etc.) and little disclosure to support and leverage the local tourism. In addition to the waterfalls, Gruta da Fazenda Furnas, the architecture of the city itself and Chapada dos Negros, are some of Arraias' tourist attractions.

Arraias also has events that attract many tourists to the region, such as religious parties, carnival, etc.

Furnas Farm Cave

The cave is approximately 30 to 40 meters wide and 20 meters tall.

Inside it, there are four different and wide halls, approximately 40 meters long. There are stalactites and stalagmites in the cave. Annually, the cave is visited by people of the region during the Pilgrimage of Nosso Senhor do Bonfim, which takes place in August 06. The place offers easy transportation, requiring low light. It is 22km Southeast of the city. It can be accessed by cars through an unpaved side road that connects the city of Arraias to Combinado.

Lapa do Bom Jesus Cave

According to a speleological survey, the study area has a cave called "Furna da Lapa do Bom Jesus" used for religious practices, such as pilgrimages.

A supplementary survey will be carried out on this cave, its relation with the community and the proximity to the Project, taking into account its cultural aspects, as indicated in Section 7.3. This survey is planned within the scope of the Social Infrastructure Program.

Chapada dos Negros

Area of ruins and great auriferous excavation pits, the exact place that gave origin to Arraias. Its name comes from the great contingent of slave labor that worked in the exploration of gold mines next to Arraias River. It is estimated that during the gold mining period the slave population of the location amounted approximately ten thousand black people. This attraction is 3km away from the city.

History Panel

Downtown, at Square Dr. João d'Abreu, a history panel was built describing the evolution cycle of the city, which dates from 1735, with mining and livestock activities up to 1968, with the installation of the hydroelectric power plant that supplied the city. The panel, built in 1962 and entirely made of tiles, was created by Maria Guilhermina, an artist from the state of Goiás.

Carnival (Shrovetide)

Carnival in Arraias is an old tradition with its own characteristics that differ from the traditional parties held in the country. It is also the most popular party of the region. The high point of the party, which takes place in February, is the traditional “shrovetide” – habit of wetting people while listening to the sound of carnival songs in a *trio elétrico* [truck with a sound system and a music group playing for the crowd], along with accordions.

During “shrovetide”, manioc flour is distributed to participants. At night, at Clube Social Arraiano, lively carnival balls take place.

Holy Week

The Holy Week is an event that happens every year, when the population is invited, through a ratchet, to the lamentations and Via Sacra. A group of *lamenters* and actors fervently relive the mysteries of passion, death and resurrection of Christ, in an expressive procession through the streets of the city. In a demonstration of faith, people go up the Morro da Cruz. The Holy Saturday is celebrated with the traditional “*caretagem*”. People go to the streets of the city wearing masks, taking everything they can to assemble “Maundy Thursday” and further, to the burning of Judas with the reading of the Testament.

Religious Parties

The main religious party of the city is the party of Nossa Senhora dos Remédios, the patron saint of Arraias. The pilgrimage happens every year from August 30 to September 8. The parties happen since 1835, when the Parish Nossa Senhora dos Remédios was founded by vicar Boa Ventura – the first priest of Arraias. The population still preserves the traditions of the Feast of the Three Kings, celebrated from January 1 to 6; the Feast of the Divine; the Feasts of São Sebastião, from January 11 to 20; and the Holly Week with Via Sacra and simulation of the mistery, passion, death and ressurection of Christ.

Handicraft, Typical Food and Folklore

The handicraft in the city consists of the production of pieces derived from clay, leather, straw and wood. The main pieces are: jars, jugs, plates, hampers, coarse sieves, sieves, wooden troughs, pestles, sculptures, needlework, crochet, leather hats and saddlebags. The typical dishes of the region are: Maria Isabel (rice “sirigado” with paçoca), mucunzá. There are also candies made of cashew and buriti and the production of liqueurs and *cachaças*. The occupation by descendants of black slaves, as well as the proximity to Bahia, was a factor which influenced the cultural traditions of Arraias. Indeed, in Arraias there are capoeira groups, rodeos, congadas and afro dances, such as *súcia*. The population also has the tradition of litany, prayers and novenas.

Birthday of the City

Arriias celebrates its birthday on the 1st day of August, with festivals, music bands, street racing, concerts and high mass.

Cashew Festival

Event organized by the fruit producers in Arraias, with the exhibition of fruits, candies and liquors. The event offers great business opportunities.

Agricultural Exhibition

During the “Agricultural Exhibition”, carried out every year in June, Arraias receives a lot of people, who come from several neighboring cities to the event and investors who expect to find business opportunities. The exhibition has the participation of several local and national artists.

Structure of the Executive, Legislative and Judicial Branches

The structure of the Executive Branch in Arraias is composed by the following agencies and autarchies, in addition to the Mayor's Office:

- Secretariat for Internal Control;
- Attorney-General of the City;
- Administration Department;
- Financial Department;
- Education Department;
- Health Department;
- Urban Development Department;
- Production, Commerce and Industry Department;
- Social Promotion Department;
- Department of Youth, Sports and Leisure;
- Culture and Tourism Department;
- Transports Department;
- Coordination of Human Resources;
- Coordination of Collection and Surveillance;
- Special Advisory Services 1;
- Special Advisory Services 2;
- Coordination of Public Services;
- Coordination of Production, Commerce and Industry;
- Coordination of Social Programs;
- Coordination of Support to Youth, Sports and Leisure;
- Coordination of Tourism and Environment;
- Coordination of Mechanics and Garages;
- Coordination of Community Assistance;
- Coordination of Material Resources and General Services;
- District Administrator;
- School Supervision;
- Health Supervision;
- Coordination of Elementary School;
- Coordination of Nursery Schools;
- Coordination of Sanitary Surveillance;
- Coordination of Health Programs;
- Coordination of Health Units.

The legislative branch of the city is composed by nine city councilors. The Judicial Branch is represented by the Prosecution Office and the Office of the Public Defender. Arraias has a courthouse, an electoral court and a representation of the Brazilian Bar Association. With regards to planning and management instruments, Arraias has an Organic Law, Tax Code, Plan of Positions and Salaries and Code of Sanitation.

Major Antonio Wagner Barbosa Gentil was elected in 2008, with 3,465 votes (63.55% of valid votes.) According to the Superior Electoral Court, the city of Arraias has 7,900 voters, out of which only 6,262 went to the ballot boxes in the 2008 elections.

Civil Society Organizations - NGOs

In Arraias, two NGOs intensely operate along with the community: Associação Cultural Chapada dos Negros – ACCN and NGO Viva Arraias.

ACCN was created by Mestre Fumaça. In order to add value to the importance of the black origin of children and teenagers and the background of their people, ACCN has created a project called Criança Capoeira Esporte e Cultura. Its purpose lies on promoting awareness, mobilization, cultural rescue, preservation of immaterial historical heritage and the integration of children and youngsters under the status of social risk, as well as their physical, cognitive, affective and social development, thus contributing to the effectiveness of Law 10.639/03, which makes the education of the Afro-Brazilian History and Culture mandatory in the country. Today, ACCN develops the following projects:

- Criança Capoeira Esporte e Cultura Project – Children Sports and Culture Capoeira
- Capoeira na Escola Project – Capoeira at School
- Ginga Mulher Project – Ginga Women
- Capoterapia and Capoeira Laboral Project
- Chapa Afro Dance Group
- Digital Inclusion Juventude Online
- Música Toca a Gente – Music Moves People

The NGO Viva Arraias is an organization that gathers people who are friends or sympathizers, were born, are living, or have lived in Arraias, and are interested in offering their time, talent, competences and skills as volunteers in favor of the socio-cultural, economic and environmental development of Arraias. Viva Arraias intends to operate in partnership with the civil society, public administration, political leaderships and private initiative, adding knowledge and actions in the preservation and development of public assets and collective values. It also intends to follow the management of public assets and search for a more active participation, which suits the communities' interests.

Currently, NGO Viva Arraias develops the following projects:

- Centro Cultural de Arraias – Museum
- Rio Limpo Project – Ministry of Environment
- Chega de Saudade Project
- Casa do Artesão
- Criança Atentada Project

Economic Activities

Productive and Service Structure

In general, the economic sector can be expressed in different ways. The most common is the Internal Gross Product (IGP), an indicator that represents the sum of wealth, in monetary values, of all the goods and services produced in a certain region.

According to IBGE (2010), as most small Brazilian cities that do not comprise industries or large companies in their territories, in 2008, the economy of Arraias was based on the tertiary sector (44.3%), followed by the primary sector (42.1%) and last, by the secondary sector (**Table 5.2.3.1.u**).

Table 5.2.3.1.u
GDP composition in the City of Arraias in 2008

Economic Sector	Arraias Amount (R\$)	State Amount (R\$)
Agriculture	31,392.00	1,796,061.00
Industry	7,725.00	2,430,474.00
Service	33,035.00	5,855,530.00
Tax	2,485.00	1,011,999.00
GDP	74,637.00	11,094,063.00
GDP per capita	7,024.00	8,921.00

Source: IBGE, 2010

With respect to GDP, the city of Arraias ranked 23rd in 2007, in comparison with the rest of the State, and had a share of 0.67%. On the other hand, GDP per capita was 7.024 and ranked 30th in comparison with the general classification of the 139 cities that form the State.

According to data presented in **Table 5.2.3.1.v**, from 2002 to 2005, the collection of ICMS had a significant deficit in every economic activity, above all, in two main economic sectors of the city: livestock and trading. The lowest collection of ICMS in the period analyzed was observed in 2004.

Table 5.2.3.1.v
Collection of ICMS per economic activity

Activity	2002	2003	2004	2005
Agriculture	2,724.08	3,145.45	12,223.88	6,285.95
Livestock	241,662.95	223,852.89	15,076.21	185,495.08
Industry	93,682.32	23,038.93	15,076.21	91,086.67
Commerce	433,779.9	356,684.28	193,173.73	296,978.11
Transportation	59,045.09	23,986.09	43,430.21	1,202.60
Communication	-	225.00	-	-
Energy	-	-	-	-
Mineral	-	-	-	-
Fuels	6,195.04	3,029.10	3,518.53	-
TOTAL	837,089.47	633,961.74	282,498.77	581,048.41

Source: Department of Finance, Economical Statistics of Tocantins - SEBRAE

Table 5.2.3.1.w shows the number of companies by activity in Arraias. The service and trading sectors are the most representative. In 2000, the city registered 145 companies. In 2005, they were 111 companies. The drop in the number of companies in Arraias reflected in the collection of ICMS. All economic sectors in the period registered losses in the number of facilities, but the most affected was the service sector, with the loss of 25 units. The data presented confirm the answers of respondents in the environmental perception survey, related to the main difficulty in the city, that is, the lack of job opportunities.

Table 5.2.3.1.w
Number of companies by economic sector

ACTIVITY	2000		2005	
	Quantity	%	Quantity	%
Commerce	54	37.24	48	43.24
Industry	7	4.83	4	3.60
Service	84	57.93	59	53.15
Total	145	100	111	100

Source: SEBRAE – Business Census. REMARK: In the year 2000: participating companies – 129, non-participant – 16. In the year 2005: participating companies – 104, non-participant – 7.

Arraias follows the Brazilian profile concerning the registration of commercial establishments.

In Brazil, according to SEBRAE (2010), micro-companies represented 93.8% of the total of Brazilian companies in 2007. From 2000 to 2005, Arraias registered a larger number of micro-companies, with representativeness of 98.08%, followed by small ones, with 1.92% (**Table 5.2.3.1.x**). In such years, medium and large companies were not registered in Arraias.

Table 5.2.3.1.x
Number of companies according to the capital property in Arraias

Company	2000		2005	
	Quantity	%	Quantity	%
Micro	127	98.45	102	98.08
Small	2	1.55	2	1.92
Total	129	100	104	100

Source: SEBRAE – Business Census.

Agriculture

In 2008, according to data from IBGE (2010), the variety of agricultural products was small in Arraias, where the production of only five types of products stood out among temporary crops, distributed in an area of 5,325 hectares, with 187,250 tons of products harvested, highlighting the production of sugarcane and cassava. Sugarcane is frequently used by local population for the home production of rapadura; and also as a food supplement for animals in the drought season. Cassava is a subsistence crop. With respect to the permanent crops, chestnut and banana were the ones that presented the largest planted area in 2008, 60 and 25 hectares, respectively. (**Table 5.2.3.1.y**)

Table 5.2.3.1.y
Temporary and permanent crop – planted area and production in 2008

Type of Crop	Product	Planted Area (ha)	Production
Temporary Crop	Pineapple	25	500 (thousand fruit)
	Rice	900	1,350 (t)
	Cane	2,500	175,000 (t)
	Cassava	400	6,400 (t)
	Corn	1,500	4,500 (t)
	Product	Planted Area (ha)	Production
Permanent Crop	Banana	25	250 36
	Chestnut	60	20
	Passion fruit	2	

Source: IBGE 2010 – Municipal Agricultural Production

Livestock

The study area is more focused on livestock, as this economic activity is its second largest source of collection. **Table 5.2.3.1.z** below shows the livestock production in the city in 2008. According to data from IBGE (2010), the creation of bovine cattle stands out, with 66.7%, followed by poultry, with 18.92%.

Table 5.2.3.1.z
Municipal Livestock in 2008

Cattle	Production No. Heads
Bovine	114,600
Equine	5,300
Buffalo	350
Asinine	120
Mule	1,100
Swine	2,960
Caprine	300
Ovine	8,000
Roosters, chickens and chick	18,000
Hen	14,500
Milked cows	6,500

Source: IBGE, 2010 – Municipal Livestock Production 2008.

To evaluate the impact of the Project in the municipal public finances of Arraias-TO and Campos Belos-GO, a study will be carried out to calculate the estimated impact on taxes and on the monetary circulation in the cities. This study is planned within the scope of the Social Infrastructure Program.

The construction of the Project and its subsequent operation will generate a significant number of job opportunities in the region. According to estimates, there will be 1,500 direct jobs in the construction phase and 389 direct and 800 indirect in the operation phases.

In order to evaluate the future impact of the generation of job opportunities, the Social Infrastructure Program, described earlier, will present a study calculating the estimates regarding the population growth due to the indirect jobs generated by the service and trading sectors. Both surveys shall be performed with the cities of Arraias-TO and Campos Belos-GO.

In addition, there will be special attention to the local workforce, where information such as: capability, economically active population, employment and unemployment rates in the cities and type of workforce existing in Arraias and Campos Belos will be collected. This survey will be supportive for the development of a future “Local Hiring Plan”. Within this plan, there will be hiring estimate for local workforce in each phase of the Project, as well as the outsourced workforce. Another aspect to be addressed in this plan is the establishment of partnerships with educational institutions and city halls for the qualification of workers.

5.2.3.2

Campos Belos – GO

The settlement of Campos Belos occurred during the last decades of the XIX century, influenced by gold mining in the region of Arraias and Monte Alegre de Goiás.

After the gold exploitation peak period phased away, inhabitants in those areas searched for a region of open fields and croplands in order to settle down into agriculture and cattle raising.

In 1883, a chapel was built on donated land from Almas Farm which belonged to Ciriaco Antônio Cardoso and Guilhermino de Araújo Guimarães. On one same year, the farm was upgraded to an *arraial* under the name of Campos Belos. This name, meaning beautiful fields, was coherent with a landscape of extensive fields on a vast semi-plane area.

Eight years after its foundation, the *arraial* then became a district, created by the municipal council of Chapéu, currently Monte Alegre do Goiás, in 1891, after having belonged to the municipality of Arraias. The district was created under the name of Campos Belos, by Decree no. 5, of March 05, 1890, subordinated to the municipality of Arraias. Under State Law no. 271, of July 04, 1906, the district of Campos Belos is annexed to the municipality of Chapéu, therefore no longer belonging to the municipality of Arraias.

Campos Belos district, in 1911, belongs to the municipality of Chapéu, according to an administrative territorial classification. In future territorial divisions occurring in December 31, 1936 and December 31, 1937, the municipality of Chapéu was extinct, and its territory annexed to the municipality of Arraias.

According to Art 62 of the transitory provisions Act, of July 20, 1947, the district of Campos Belos returns to the municipality of Chapéu, remaining as such in the territorial division of July 1, 1950.

According to State Law No. 781, of October 1, 1953, Art. 1, the current district of Campos Belos was separated from the municipality of Chapéu, and became a municipality; Art. 2 states that the village of Campos Belos becomes a city and will be the seat of the municipality created under the same name.

Campos Belos demography is best understood through the history of migration movements. By the time of its foundation, people inhabiting the region belonged to traditional families, which were Portuguese descendants and great landowners. Since the creation of Campos Belos, members of the Batista Cordeiro, the Costa Madureira and the Cardoso families were present. There was also a minority of *goianos* (from the State of Goiás) coming from the South, which were attracted by the gold fever in Arraias and Monte Alegre and were still living there during the decadence period of the gold mining cycle,

together with a large number of very poor families. Thus, the region was very poor and far away from Brazil's main centers.

As from 1920, when population settlement increased, several families came from the State of Bahia (the *baianos*) and integrated with the local population, acquiring land properties and introducing a culture to this region which was typical of the neighboring State of Bahia.

The largest neighborhood of the city is *Vila Baiana*, which is a reference to these immigrants. The most important people of the city came from Bahia, as Mr. Mariano Barbosa Júnior, professor, marshal; Mr. Francisco Xavier de Oliveira, the first mayor; Mr. Agripino Almeida and his wife, Mrs. Licíria Almeida, the first woman to hold a city councilwoman's office, in 1963. As from the 1970s, Campos Belos received a significant wave of migrants from the State of Minas Gerais (the *mineiros*) who came in search of cheaper land. This migration brought about a significant growth in population and in economic development.

The sum of all these groups has created a peculiar way of speaking in the Campos Belos region. There is no defined accent and it is possible to hear many different language expressions. In recent years many people have also come to the region from the southern part of Brazil, from Minas Gerais and São Paulo.

The Brazilian Constitution of 1988 divided the former State of Goiás in half: the northern part became the State of Tocantins. Campos Belos then became an interstate boundary municipality. It thoroughly developed its trade during the 1990s and the 2000s since the city's commercial infrastructure was the closest one available to serve the new State's boundary populations. With Palmas as the capital city of the new State of Tocantins, Campos Belos also became an alternative access route to the north of Brazil.

Infrastructure

The basic infrastructure conditions of the city of Campos Belos are presented below, and they refer to: population, sanitation, pavement, communication, transportation, energy, health, education, leisure and tourism, government structure, non-governmental organizations and economic activities.

To enable further analyses, studies and estimates based on the data collected, the information regarding this infrastructure diagnostic will be updated within the Social Infrastructure Program.

Demography and Population Dynamics

The municipality of Campos Belos has a total area of 724 km². According to the latest IBGE census (2010), its population reached 18,395 inhabitants.

According to **Table 5.2.3.2.a**, the period between 2000 and 2010 shows an average growth of 7.6%. However, growth registered between 1996 and 2000 is greater due to the fact that the municipality was undergoing a consolidation phase, and also due the creation of the State of Tocantins which, in turn, contributed to the municipality's population and economic development.

Table 5.2.3.2.a
Demographic data of Campos Belos

Municipality	Total Population		Annual Geometric Growth Rate (%p.a.)		Demographic Density (hab/km ²)	Urbanization Rate (%)
	2000	2010	1996/2000	2000/2010		
Campos Belos	17,047	18,395	2.98	0.76	25.40	87.0

Source: IBGE, Demographic Census 2000 and 2010

The demographic density of the city is only 25.4 inhabitants per square kilometer; the state average is 17.65; the regional average is 6.5. The urbanization rate is 87%, that is, the municipality is intrinsically urban, with almost all its population living in the city, and complaining about the lack of opportunities for income generation, as observed during the field research.

With respect to the male and female contingents, male population represents 57% of the rural population, while the female population is more representative in the urban area with 50.76% (**Table 5.2.3.2.b**). These data are based on the 2000 demographic census, as the 2010 data are not yet available from the IBGE

Table 5.2.3.2.b
Residents by gender and domicile status

Municipality	Urban Population		Rural Population	
	Female	Male	Female	Male
Campos Belos	7,211	6,996	1,216	1,624

Source: IBGE – Demographic Census - 2000

With respect to the distribution of population by age group, according to data presented in **Table 5.2.3.2.c**, there is equivalence between the young population (up to 17 years old) and the economically active adult population, from 20 to 59 years. This latter segment represents 45% of the population, which is very close to the younger segment, from 0 and 17 years, which is 47%.

Table 5.2.3.2.c
Population of Campos Belos by age group

Age Group (Age)	Campos Belos/GO Population
0 to 4	1,720
5 to 9	1,918
10 to 14	2,214
15 to 19	2,217
20 to 24	1,639
25 to 29	1,281
30 to 34	1,194
35 to 39	1,087
40 to 44	927
45 to 49	689
50 to 54	504
55 to 59	512
60 to 64	367
65 to 69	287
70 to 74	234
75 to 79	141
80 or more	116
Total	17,047

Source: IBGE, 2000 Demographic Census

Migration Flow

The migration movement in the city of Campos Belos shows a gender variation. When migration occurs within the same State there is male predominance. When migration occurs from outside the State, female migrants are slightly predominant, although the difference is small between genders (**Table 5.2.3.2.d**).

Table 5.2.3.2.d
Migration flow in the city of Campos Belos – 2000

Municipality	From Other States (%)		Within the same State (%)	
	Male	Female	Male	Female
Campos Belos	1,864	2,080	6,634	6,300

Source: IBGE, 2010.

Female predominance in the migration flow between the States is a relatively recent phenomenon and may be related to the search of better education opportunities in other localities.

To complement this survey, the Social Infrastructure Program has planned an Influx Management study to estimate the impact of the new project on population growth in the city of Arraias-TO and Campos-GO, as indicated in Section 7.3. It will consider measures to address potential overloading of infrastructure and services.

Quality of Life

Table 5.2.3.2.e. below presents the HDI calculated for the city of Campos Belos, comparing it with the state of Goiás in 1991 and 2000. As can be seen, even though there has been a considerable progress in all dimensions in Campos Belos from 1991 to 2000, even if there were improvements in 2000, the Municipal Human Development Index – M-HDI of the municipality remained at levels lower than the state levels. In any case, it can also be seen that the progress achieved in Campos Belos in this intercensal period was at rates close to those observed in the entire state, in the various dimensions of the research, which increased the M-HDI of Campos Belos.

Table 5.2.3.2.e
Municipal Human Development Index of Campos Belos

HDI	Years	Campos Belos	State
M-HDI	1991	0.638	0.700
	2000	0.708	0.776
HDI-Income	1991	0.592	0.667
	2000	0.607	0.717
HDI-Longevity	1991	0.621	0.668
	2000	0.716	0.745
HDI-Education	1991	0.701	0.765
	2000	0.800	0.866

The dimension that most contributed to the increase of Campos Belos' HDI between 1991 and 2000 was Education, increasing from 0.701 to 0.800 in the period, followed by the improvement of Longevity, from 0.621 to 0.716 and a slight increase in Income, from 0.592 to 0.607. For the state, similar to what happened to Campos Belos, the dimension that most improved was Education, followed by Longevity and Municipal HDI.

In 2000, the Municipal Human Development Index of Campos Belos was 0.708. According to the UNDP's classification, the municipality is among the regions considered to have an average human development (HDI between 0.5 and 0.8). Compared to other Brazilian cities, Campos Belos presents an intermediate situation: it is ranked 2848th, considering that 2,847 municipalities (51.7%) are in a better situation and 2,659 municipalities (48.3%) are in a worse or equivalent situation.

Compared to other cities of the state, Campos Belos is not in a good situation: it is ranked 200th, considering that 199 municipalities (82.2%) are in a better situation and 42 municipalities (17.85%) are in a worse or equivalent situation. It is paradoxical to verify a certain contradiction in the distribution of these data. Although the municipality is in an intermediary position for UNDP, according to its MHDI, it presents low employment, education and income distribution rates, aspects which are relevant for creating a virtuous cycle of human development.

Sanitation

Water treatment

In the municipality of Campos Belos, water is supplied by Companhia de Saneamento de Goiás S. A. (SANEAGO). Water catchment is carried out directly from the Montes Claros Creek, in the Sub-basin of Arraias River, which will not be affected by the activities of the proposed Project. The water treatment station is in operation and its current treatment capacity totals approximately 50 liters per second.

All water catchment flows through the water treatment station Control and Analysis system. Water storage and distribution dams have a total capacity of 1,270 thousand liters and supply 5,835 domiciles in the municipality (data provided by the SANEAGO Agency in Campos Belos in March 2011).

Sanitary Sewer

Sewage treatment is implemented to separate highly contaminating waste from the population, water courses and other vital resources. Benefits of sewage treatment for the population, is not only connected to health conditions, but also to quality life.

At Campos Belos, sewage treatment system is biological and utilizes three treatment ponds. Approximately 70% of waste generated in the municipality's urban zone is collected by the sewage network system, and after treatment, is discharged in Montes Claros Creek.

Solid Waste

Campos Belos has a sanitary landfill. However, it is poorly utilized because waste is disposed of in an open-air dump without any criteria. Waste is collected daily, using 06 vehicles, 12 people who collect approximately 20 tons/day.

Asphalt paving

With respect to the coating of streets and avenues, the city has 240,000 m², approximately 60% of its road system covered with asphalt paving or cobblestones (blocks). Several neighborhoods in the urban area of Campos Belos were observed, especially those in expansion, located in the suburbs where streets are not paved yet.

Communication

The city of Campos Belos receives TV signals from three national open television networks - Globo, Record and SBT – through a transmission tower installed in the city. There are some residences which have cable TV networks and parabolic antennas, which allows access to more than 100 national and international TV channels.

The fixed telecom service is operated by Oi Brasil Telecom and the mobile telecom system is operated by four companies – Oi Brasil Telecom, TIM, Claro and Vivo.

The municipality is still served by two radio stations: Rádio Atividade FM and Rádio RCB AM.

The following newspapers are distributed in the municipality: O Estado de Goiás; Jornal o Popular; Folha do Sudeste; Diário da Manhã and Jornal Opção.

The bank network has four institutions, and Banco do Brasil, Bradesco and Itaú operate directly. Caixa Econômica Federal operates through “Caixa Aqui” in lottery kiosks and Bradesco also operates through “Banco Postal” in post offices.

Transportation

Road access to Campos Belos is by highways BR-010, GO-452 and GO-118. The city of Campos Belos is also provided with a paved runway, and an airline passenger terminal which is currently being designed, apart from a bus station, from where state and interstate buses arrive and depart.

The city of Campos Belos is served by the following transportation companies: Real Expresso, Expresso São José do Tocantins, Expresso União, Expresso Atual.

Energy

The municipality of Campos Belos is served by Companhia Energética de Goiás – CELG, which has a local office. Campos Belos has a serious power failure problem. Power failures occur several times a day, and in some cases, it may take hours to restore power.

In the 2000 IBGE census (2010), in Campos Belos, 3,725 domiciles had electrical lighting (**Table 5.2.3.2.f**), and, out of these, 91% are in the urban area, and 9%, in the rural area.

Table 5.2.3.2.f
Private residences with electrical lighting in 2000

N° of Domiciles	
Urban	3,395
Rural	330
Total	3,725

Source: IBGE (2000)

Health

In addition to the study already performed, the Social Infrastructure Program includes a supplementary survey of health in the municipalities. More data about health conditions will be provided, such as the quantity of hospital beds and admissions for each medical specialty, first aid units and procedures and state and/or federal transfers for the health in the cities. It shall also include a data survey on HIV/AIDS, with the number of cases of dengue fever and other epidemics.

In addition, a study will be carried out to calculate the estimated use of health services in both cities in order to view the possible impacts of the future Project on this specific area.

Below we present the conditions of the health sector in the city of Campos Belos.

Structure of Services provided to the Population

According to data presented in **Table 5.2.3.2.g**, the hospital network in Campos Belos has 48 hospital beds, totaling an average of 2.5 beds for each group of one thousand inhabitants, lower than WHO standards, which is 5 beds for each group of one thousand inhabitants. It is worth to point out that Campos Belos' hospital network, in addition to serving the local population, serves the population of the neighboring cities.

Table 5.2.3.2g
Health facilities by type and availability of beds – 2009

Type of Facility	Quantity	Beds
Health Center/Basic Health Unit	7	0
General Hospital	2	48
Support to Diagnosis and Therapy Service Unit	1	0
Health Surveillance Unit	1	0
Total	11	48

Source: Ministry of Health, 2011 – DATASUS: Data referring to Apr/2010

Table 5.2.3.2.h brings information related to the distribution of hospital facilities in Campos Belos according to the administrative sector. It shows that the municipal administration is responsible for a greater number of health facilities.

Table 5.2.3.2.h
Health facilities by administrative sector

Administrative	Quantity
State	1
Municipal	7
Private	2
Total	11

Source: Ministry of Health - DATASUS - Dec/ 2009

According to standards set by WHO, each group of 10,000 inhabitants requires 8 doctors, 2 dentists, 4.5 nurses and 14.5 nursing assistants.

According to data presented in **Table 5.2.3.2.i**, in 2010, the city of Campos Belos was far above average according to standards set by WHO, since it had 49 doctors for a population of 18,395 inhabitants, but it was a little precarious concerning the distribution of these professionals by specialty. The city has a high proportion of children and elderly and has only 3 professionals specialized in pediatrics, and only one serving the Unified Health System – SUS, whereas there were no geriatric specialists in the region.

Table 5.2.3.2.i
Quantity of professionals by specialty

Category	Total	SUS	Professional/1.000 hab.	Professional SUS/1,000hab.
Physicians	49	30	2.66	1.63
Anesthetist	5	3	0.27	0.16
General Surgeon	4	3	0.21	0.16
General Practitioner	17	10	0.92	0.54
Obstetrician Gynecologist	4	1	0.21	0.05
Family Doctor	5	5	0.27	0.27
Pediatrician	3	1	0.16	0.10
Psychiatrist	-	-	-	-
Radiologist	2	1	0.10	0.05
Dentist	5	5	0.27	0.27
Nurse	14	12	0.76	0.65
Physiotherapist	3	2	0.16	0.10
Phonoaudiologist	2	1	0.10	0.05
Nutritionist	2	2	0.10	0.10
Pharmacist	1	1	0.05	0.05
Social worker	2	2	0.10	0.10
Psychologist	2	2	0.10	0.10
Nursing Assistant	34	30	1.84	1.63
Nursing Technician	53	45	2.88	2.44

Source: CNES. Situation of the national database on Oct 04, 2010

Hospital Morbidity

Table 5.2.3.2.j presents the hospital admissions per causes and age group in the municipality of Campos Belos. According to data presented, the greatest number of admissions in this period was due to respiratory diseases, which reached 21.0% of admissions and affected a great number of children and the elderly, and are more intense between June and September, when relative humidity of air lowers and the weather is drier.

The second greatest number of admissions was due to pregnancy, and premature delivery reaching a percentage of 18.2%. In this case, data that draws attention is of women from 15 to 19 years old, who need this type of service, which evidences an extremely high rate of teenage pregnancy, reaching 45.9% of the cases for this type of hospital admission.

Infectious and parasitic diseases ranked 3rd in comparison with the number of admissions, at a percentage of 15.4%, and were more frequent in children from 5 to 9 years old, a fact that may be related to the city's precarious basic sanitation system.

Table 5.2.3.2.j
Hospital morbidity by age-group in Campos Belos

Group of Causes	Age Group									
	<1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	+ 60	Total
I. Infectious and parasitic diseases	27.8	29.9	36.4	34.7	13.5	11,8	8.1	9.4	9.8	15.4
II. Neoplasias (tumors)	0.0	0.0	10.4	0.0	0.0	5.1	2.9	1.5	1.5	3.3
III. Blood Diseases haematopoetic organ and immune disorders	0.0	1.5	1.3	0.0	1.0	0.1	0.5	1.0	0.8	0.5
IV. Endocrine nutritional and metabolic diseases	0.0	1.0	1.3	0.0	1.9	1.0	4.3	1.5	2.3	1.4
V. Mental and behavioral disorders	0.0	0.0	0.0	0.0	4.8	0.4	0.0	0.5	0.4	0.7
VI. Nervous system diseases	1.4	1.5	0.0	0.0	0.5	2.6	0.0	1.0	0.8	1.6
VII. Eye and related diseases	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VIII. Ear and mastoid apophysis diseases	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
IX. Circulatory system diseases	0.0	2.1	0.0	1.3	1.4	6.6	37.3	29.7	31.7	10.5
X. Respiratory system diseases	58.3	55.7	40.3	21.3	6.8	11.0	20.1	30.2	28.3	21.0
XI. Digestive system disease	1.4	3.1	0.0	10.7	6.3	11.7	15.8	16.3	15.5	10.3
XII. Skin and subcutaneous tissue	0.0	0.0	1.3	0.0	0.0	0.2	0.5	0.0	0.0	0.2

Group of Causes	Age Group									
	<1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	+ 60	Total
diseases										
XIII. Musculoskeletal system and connective tissue diseases	0.0	0.0	0.0	2.7	1.4	1.0	1.4	0.0	0.4	0.9
XIV. Genitourinary system diseases	0.0	2.1	1.3	5.3	9.7	9.2	7.7	7.4	6.8	7.4
XV. Pregnancy, childbirth and puerperium	0.0	0.0	0.0	12.0	45.9	26.9	0.0	0.0	0.0	18.2
XVI. Certain conditions originating in the perinatal period	9.7	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.4	0.4
XVII. Congenital malformations, deformations and chromosomal abnormalities	1.4	0.5	0.0	2.7	0.0	0.1	0.0	0.5	0.4	0.3
XVIII. Symptoms, signs and abnormal clinical and laboratory tests	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
XIX. Injuries, poisoning and certain other consequences of external causes	0.0	1.5	6.5	9.3	6.3	4.9	1.4	0.5	1.1	4.0
XX. External causes of morbidity and mortality	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
XXI. Contacts with health services	0.0	0.0	1.3	0.0	0.5	6.3	0.0	0.0	0.0	3.2
ICD 10 th revision unavailable or in blank	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0									

Source: Ministry of Health - DATASUS (SIH/SUS) - Dec/ 2009

Mortality

Table 5.2.3.2.k presents the mortality rate by age group in the city of Campos Belos in 2008. Circulatory system diseases, which mainly include infarctions and strokes, were the ones that caused most deaths, with 30.6%. Other defined causes have the same percentage; both affected more the population from 50 to 65 years old. External causes for morbidity and mortality represented 12.9% of deaths and were more frequently observed in the 20 to 49 age bracket.

Table 5.2.3.2.k
Mortality by group of causes in Campos Belos in 2008 (in %)

Group of Causes	< 1	1 to 4	5 to 9	10 to 14	15 to 19	20 to 49	50 to 64	+ 65	Total	1 to 4
I. Infectious and Parasitic Diseases	-	-	-	-		16.7	17.6	2.6	2.3	8.2
II. Neoplasias (tumors)	-	-	-	-	-	5.6	11.8	23.1	23.3	14.1
IX. Circulatory system diseases	-	-	-	-	-	16.7	35.3	43.6	44.2	30.6
X. Respiratory system diseases	-	-	-	-	-	5.6	5.9	10.3	9.3	7.1
XVI. Certain conditions originating in the perinatal period	77.8	-	-	-	-	-	-	-	-	8.2
XX. External causes of morbidity and mortality	-	-	-	-	100.00	38.9	17.6	-	2.3	12.9
Other defined causes	22.2	100.00	-	-	100.00	16.7	11.8	20.5	18.6	18.8
Total	100.00	100.00	-	-		100.00	100.00	100.00	100.00	100.00

Source: SIM. Situation of the national database on 2009 Note: Data from 2008 are preliminary

According to **Table 5.2.3.2.l**, causes for mortality in Campos Belos in 2008 varied in relation to the previous years (2002 to 2007), presenting mortality causes for all defined classes, except for malignant neoplasm of uterine cervix (/100.000 women).

In 2008, in Campos Belos, Diabetes mellitus was the main cause of mortality, accounting for 47.4 of the registered deaths. This cause may be explained by the trend towards urbanization and changes in life style which the municipality and its population are experimenting.

Another observation was with regards to the appearance of mortality caused by Aids/Sida, reaching an index of 10.5 for every 100,000 inhabitants, which had not occurred in the previous years.

Table 5.2.3.2.l
Mortality coefficient

DEATH CAUSE	2002	2003	2004	2005	2006	2007	2008
Aids	0.0	0.0	0.0	0.0	0.0	0.0	10.5
Malignant neoplasm of breast (/100.000 women)	0.0	0.0	0.0	10.9	21.6	0.0	10.6
Malignant neoplasia of the uterine cervix (/100,000 women)	11.5	0.0	11.3	10.9	10.8	0.0	0.0
Acute myocardial infarction	17.1	16.9	33.4	16.2	26.7	15.8	26.3
Cerebrovascular diseases	45.6	39.4	44.5	48.7	42.7	42.1	42.1
Diabetes mellitus	28.5	11.3	38.9	10.8	5.3	15.8	47.4
Transport accidents	34.2	28.2	38.9	27.0	10.7	26.3	26.3
Aggressions	17.1	33.8	33.4	21.6	26.7	15.8	15.8

Source: SIM, 2010. Situation of the national database on 2009 Note: Data from 2008 are preliminary.

The infant mortality in Campos Belos, presented in **Table 5.2.3.2.m**, is above the Brazilian average, that is, 11 deaths per one thousand live births and also slightly above the average accepted by the World Health Organization, which corresponds to 10 deaths for each 1,000 inhabitants.

Table 5.2.3.2.m
Other mortality indicators

OTHER MORTALITY INDICATORS	2002	2003	2004	2005	2006	2007	2008
Total de óbitos	83.0	81.0	103.0	95.0	96.0	96.0	110.0
No. of deaths per 1,000 inhabitants	4.7	4.6	5.7	5.1	5.1	5.1	5.8
% óbitos por causas mal definidas	18.1	17.3	16.5	13.7	16.7	14.6	22.7
Total de óbitos infantis	4.0	10.0	6.0	8.0	6.0	3.0	11.0
No. of infant deaths for undefined causes	0.0	1.0	1.0	2.0	2.0	0.0	2.0
% of infant deaths within total deaths*	4.8	12.3	5.8	8.4	6.3	3.1	10.0
No. of infant deaths for undefined causes	0.0	10.0	16.7	25.0	33.3	0.0	18.2

Source: SIM, 2010. Situation of the national database on 2009

* Proportional infant mortality coefficient

Education

According to IBGE 2000 data presented in **Table 5.2.3.2.n**, the literacy rate in the municipality of Campos Belos was 71.4% , which is below the national average (86.37%). This consideration was based on inclusion of the population above 25 years old. IBGE's data of the "population without any education" in this age bracket is around 11% of the total population of the municipality.

Table 5.2.3.2.n
Level of education in the municipality of Campos Belos – Literacy rate

Municipality	Population	Illiterate Population (Without Education)	Literate People	Literacy Rate (%)
Campos Belos	17,047	1,895	5,419	71.4

Source: IBGE 2000 Census

In 2000, in Campos Belos, 34% of the population (5,883 people) attended school. Out of this total, 83% were urban residents, and 17%, rural residents. Elementary school level presented a higher frequency level, both in the urban area with 61.42% and in the rural area with 13.42%. The sum of other education levels totaled more than 25% (**Table 5.2.3.2.o**).

Table 5.2.3.2.o
School attendance per level of education and area in the municipality of Campos Belos

Education Levels	Rural	Urban
Nursery School	0.13	0.55
Pre-elementary School	1.82	6.79
Adult Literacy	-	0.08
Elementary School	13.42	61.42
High School	1.22	11.11
University Exam Prep Course	-	0.56
University - Undergraduate	0.14	2.76
University – Graduate (Master /Doctorate Degrees)	-	-

Source: IBGE (2000)

In the 2009 Education Census, the municipality of Campos Belos had 20 education facilities, and out of this total, 13 were elementary schools, 5 were pre-elementary schools and 2 were high schools. Seven of the elementary schools were under municipal administration, 4 under state administration and 2 were privately owned. The only 2 high schools were under state administration. Three pre-elementary schools were municipal and 2 were privately owned. (**Table 5.2.3.2.p**)

Table 5.2.3.2.p
Number of school facilities in the municipality of Campos Belos per level of education and type of administration in 2009

Municipality	Type of Administration	Pre-elementary School	Elementary School	High School
Campos Belos	State	-	4	2
	Federal	-	-	-
	Municipal	3	7	-
	Private	2	2	-
	Total	5	13	2

Source: IBGE - Cidades e INEP – 2009 Education Census

In Campos Belos in 2009, the education network presented 5,066 students duly enrolled in the pre-elementary, elementary and high school levels. Elementary school ranked as highest in number of enrollments, with 3,680; high school presented 846 enrolled students; and, pré-elementary school 540 students. Elementary school always registers a higher number of enrollments due to the fact that parents are obliged to send their children to school, and, in case this does not occur. Parents may be seriously punished, and the municipality is obliged to provide free elementary education (**Table 5.2.3.2.q**)

Table 5.2.3.2.q
Number of enrollments per level of education and type of administration in the Municipality of Campos Belos

Municipality	Type of Administration	Number of enrollments		
		Pre-elementary School	Elementary School	High School
Campos Belos	State	-	1,089	846
	Federal	-	-	-
	Municipal	445	2,421	-
	Private	95	170	-
	Total	540	3,680	846

Source: IBGE - Cidades e INEP – 2009 Education Census

The student/teacher rate at all levels of education was satisfactory in 2009, but below the national average of 30 students or more per teacher, according to the INEP research (2004). Elementary school had 18.21 students per teacher; high school, 15.66 students per teacher; and, pre-elementary school presented the highest rate of 21.60 students per teacher (**Table 5.2.3.2.r**)

Table 5.2.3.2.r
Number of teachers per level of education and type of administration in the Municipality of Campos Belos

Municipality	Type of Administration	Number of teachers		
		Pre-elementary School	Elementary School	High School
Campos Belos	State	-	73	54
	Federal	-	-	-
	Municipal	20	114	-
	Private	5	15	-
	Total	25	202	54

Source: IBGE - Cidades e INEP – 2009 Education Census

The young population of Campos Belos used to migrate to the cities of Goiânia and Brasília in order to attend university. Currently, Campos Belos attracts students from the southeast of Tocantins State and northeast of Goiás State. The State University of Goiás – UEG – local branch offers courses in the following areas: Languages (Portuguese/ English), Pedagogy, Agriculture and Livestock Farming Technologies and Public Administration. Apart from courses offered by the local UEG branch, Campos Belos student population is served by the Federal University of Tocantins – UFT in the neighboring city of Arraias. Both universities offer approximately 10 courses to the region's students. In addition to this, Terra Faculty, a private institution, offers undergraduate online classes via distance education.

Public Safety

To monitor public safety conditions, a survey will be carried out on the theme within the Social Infrastructure Program. In addition, this same program includes a Subprograma de Segurança Pública e Subprograma de Monitoramento Socioeconômico nos dois municípios afetados pelo projeto. These subprograms will take into consideration themes such as prostitution, domestic violence, alcoholism, use of narcotics and criminality.

These Subprograms will be important aiming to accompany the potential negative impacts of the Project on this area.

Leisure and Tourism

Campos Belos, a municipality surrounded by mountain ranges, located in a region with beautiful natural landscape and great abundance of water resources, comprises a vast tourist potential which is yet unexploited. This is mainly due to lack of infrastructure (accommodation and restaurant facilities) and of promotion to stimulate and develop local tourism. In Campos Belos there are several attractions, such as caves, streams and a water resort, apart from the city itself. Campos Belos still relies on events which attract many tourists, such as the religious holiday parties, carnival, agricultural and livestock exhibitions, music festival, etc.

Cultural Calendar of Campos Belos

January

- 06 – Feast of the Epiphany (Feast of the Three Kings): Holy Mass, Feast and prayers;
- 20 – Saint Sebastian Feast at the Saint Sebastian Chapel at Retiro Sector in the District of Pouso Alto.

May

- From 23/05 to 03/06 – Divine Holy Spirit Feast, at the Divine Holy Spirit Chapel at Bem Bom Sector.

June

- From 18 to 20 – “Arraiá Belo” at the Centro Olímpico Desportivo e Cultural Padre Magalhães (Olympic Sports Center)
- From 23 to 28 – Saint John the Baptist Feast at Povoado Barreirão.
- From 28 to 29 – Saint Peter’s and Saint Paul’s Feast at Saint Peter’s and Saint Paul’s Chapel Tomazinho Sector

July

- From 14 to 18 – Agricultural and Livestock Exposition of Campos Belos, with auctions, shows and rodeos.
- From 23 to 25 - FESTICAMP – Music and Poetry Festival of Campos Belos at Colégio Polivalente Professora Antusa (School).

October

- 01 – Anniversary Celebration of Campos Belos municipality

December

- From 30/11 to 8/12 – Feast of the Patron Saint – Our Lady of Conception

Structure of the Executive, Legislative and Judicial Branch

The structure of the Executive Branch in Campos Belos is composed by the following agencies, in addition to the Mayor’s Office:

- Municipal Secretariat of the Government, Administration and Human Resources;
- Municipal Secretariat of Finance, Controller’s Office and Planning;
- Municipal Secretariat of Infrastructure, Transportation and Civil Works;
- Municipal Secretariat of Social Action, Citizenship and Work;
- Municipal Secretariat of Public Health;
- Municipal Secretariat of Education, Sports, Leisure and Tourism;
- Municipal Secretariat of Agriculture, Industry, Commerce, Environment, Electric and Water Resources.

The legislative branch of Campos Belos is composed by nine city councilors. With regards to planning and management instruments, Campos Belos only has an Organic Law.

Campos Belos has a First Instance District Court with only one courthouse where civil, criminal cases and legal proceedings take place. Apart from this, there is a Special Court and there is only one Judge and the Prosecution Officer, eighteen public officers from the Justice Court of the State of Goiás and a Regional Electoral Court – TER.

Major Neudivaldo Xavier de Oliveira Sardinha was elected in 2008, with 6,115 votes (51.26% of valid votes). According to the Superior Electoral Court - TSE, the city of Campos Belos has 14,459 voters, out of which only 11,929 went to the ballot boxes in the 2008 elections.

Civil Society Organizations - NGOs

Campos Belos does not have a tradition of working with third sector organizations, the NGO's. Historically, Campos Belos has mainly worked with associations and trade/worker's unions which are basically composed of rural producers, such as:

- Rural Trade Union of Campos Belos;
- Municipal Public Servants Union of Campos Belos;
- Rural Workers' Union of Campos Belos;
- Beneficent Association of Campos Belos;
- Small Rural Producers Association of Poço Branco – Campos Belos;
- Campos Belos Association of Municipal Residents.

Economic Activities

- Productive and Service Structure

The most common economic indicator is the Gross Domestic Product (GDP), which represents the sum of wealth, in monetary value, of all the goods and services produced.

According to IBGE (2010), as most small Brazilian cities that do not comprise industries or large companies in their territories, in 2008, the economy of Campos Belos was based on the tertiary sector, followed by the primary sector and last, by the secondary sector (**Table 5.2.3.2.s**).

Table 5.2.3.2.s
GDP composition in the City of Campos Belos in 2008

Economic Sector	Campos Belos Amount (R\$)	State Amount (R\$)
Agriculture	9,400.00	8,453,361.00
Industry	10,856.00	17,261,639.00
Service	73,430.00	40,138,636.00
Value Added (VA)	93,686.00	65,853,635.00
Taxes	7,127.00	9,421,286.00
GDP	100,813.00	75,274,921.00
Population	18,984.00	5,844,996.00
GDP per capita	5,310.00	12,879.00

Source: Seplan/Sepin – Regional Accounts Management, 2010

With respect to GDP, the municipality of Campos Belos ranked 88th, in comparison with the rest of the State, and had a share of 0.67%. On the other hand, GDP per capita was R\$5,310.00

According to data presented in **Table 5.2.3.2.t**, from 2007 and 2010, the collection of ICMS varied in every economic activity, and above all, in the two main economic sectors of the city: agricultural and livestock production and services.

ICMS collection during 2010 increased 51.93 % in relation to the previous year, which shows a high growth rate in tax collection for the municipality.

Table 5.2.3.2.t
Collection of ICMS per economic activity

Activity	2007	2008	2009	2010
Agriculture and Livestock Production	152	96	10	54
Services	10	3	8	12
Industry	136	186	173	199
Mineral or fossil extraction	37	29	78	98
Communications	-	-	-	6
Retail	991	1,423	1,711	2,585
Wholesale and distributors trade	105	236	186	167
Fuels	5	4	-	1
Others	3	5	9	181
Total	1,439	1,981	2,174	3,303

Source: State Finance Secretariat - Secretaria de Estado da Fazenda – SEFAZ, 2010.

In 2008, according the Central Registry of Companies, the municipality of Campos Belos database showed 541 active companies, involving a total of 2,279 people, out of which 1,638 earned wages. The average salary was of 1.8 minimum salaries (**Table 5.2.3.2.u**).

Table 5.2.3.2.u
Companies and working population in Campos Belos

Number of companies	Total Population	Active	Total Earners	Wage	Average monthly salary
541	2,279		1,638		1.8

Source: IBGE – Central Registry of Companies - 2008

Agriculture

In 2008, according to data from IBGE (2010), agricultural products were not very diversified in Campos Belos. Production of only five types of products stood out among temporary crops, distributed in an area of 1,120 hectares, with 285,466 tons of products harvested, highlighting the production of rice and sugarcane. Rice crop is favoured by the climate and type of soil suitable for non-irrigated type of rice plantation. Sugarcane is frequently used by local population for the home production of molasses (*rapadura*); and also as a food supplement for animals in the drought season. Cassava is a subsistence crop. With respect to the permanent crops, in 2009, banana was the only permanent crop which is being planted, with a planted area of 25 hectares and a production of 100 tons. (Table 5.2.3.2.v)

Table 5.2.3.2.v
Temporary and permanent crop – planted area and production in 2009

Type of Crop	Product	Planted Area (ha)	Production
Temporary Crop	Rice	200	280,000 (t)
	Beans	140	96 (t)
	Sugarcane	150	3,450 (t)
	Cassava	30	420 (t)
	Corn	600	1,500 (t)
Permanent Crop	Banana	25	100

Source: IBGE,2011 – Municipal Agriculture Production 2009

Livestock

The study area is more focused on livestock, as this economic activity is its second largest source of tax collection. Table 5.2.3.2.w below shows the livestock production in the municipality in 2009. According to data from IBGE (2011), bovine cattle breeding stands out with 73.2%, followed by poultry, with 16.88%.

Table 5.2.3.2.w
Data from the municipal livestock in 2009

Cattle	Production No. Heads
Bovine	56,400
Equine	850
Buffalo	350
Asinine	18
Mule	100
Swine	1,850
Caprine	120
Ovine	300
Roosters, chickens and chick	7,500
Hen	5,500
Milked cows	4,000

Source: IBGE, 2011 – Municipal Livestock Production 2009.

To evaluate the impact of the Project in the municipal public finances of Arraias-TO and Campos Belos-GO, a study will be carried out to calculate the estimated impact on taxes and on the monetary circulation in the cities. This study is planned within the scope of the Social Infrastructure Program.

The construction of the Project and its subsequent operation will generate a significant number of jobs in the region. According to estimates, there will be 1,500 direct jobs in the construction phase and 389 direct and 800 indirect in the operation phases.

In order to evaluate the future impact of job creation, the Social Infrastructure Program, described earlier, will include a study of population growth due to the indirect jobs generated by the service and trading sectors. Both surveys shall be performed with the cities of Arraias-TO and Campos Belos-GO.

In addition, special attention will be given to the local workforce, where information such as: capability, economically active population, employment and unemployment rates in the cities and type of workforce existing in Arraias and Campos Belos will be collected. This survey will be supportive for the development of a future “Local Hiring Plan”. Within this plan, there will be hiring estimate for local workforce in each phase of the Project, as well as the outsourced workforce. Another aspect to be addressed in this plan is the establishment of partnerships with educational institutions and city halls for the qualification of workers.

5.2.3.3

Neighboring Communities and Vulnerable Groups

Neighboring Communities

Currently, there are two communities identified in the vicinity of the Project: District of Cana Brava and Lagoa da Pedra Community both located in the city of Arraias. The first will be addressed in this topic, and the second will be addressed later in the vulnerable communities’ item, as it is a *quilombola* community.

District of Cana Brava

Cana Brava is a district of Arraias, with approximately 100 houses and 600 inhabitants. It is located by the north of the area expected for the construction of the Project. The central road is paved. The district has electricity, piped water, telephone and a state school, family health unit, post office, *Pioneiros Mirins* Foundation, supermarkets, grocery shops, bars, cafeterias and churches. Basically, all residents grow fruits, vegetables, cassava, sugarcane, rice, beans and corn in their small farms.

Vulnerable Groups

The concept of “vulnerable groups” is very vast and there are no clear criteria for defining it. In small, medium or large Brazilian cities, economic growth is most concentrated in the central region. Other regions, like the peripheral, are characterized by unequal socioeconomic development, which accentuates the vulnerability of their communities and social groups.

Socioeconomic surveys carried out during the various visits to the municipalities in the study and field surveying visits done in Campos Belos, GO, and Arraias, TO, the communities characterized as vulnerable are those whose profile is closest to the one cited above.

In Campos Belos: Airport Sector II, Buriti Sector, Dom Alano, Industrial Sector and Barreirão.

In Arraias: Parque das Colinas, Buritizinho, Canabrava and Lagoa da Pedra.

In all of these neighborhoods, studies showed that more than 50% of those interviewed had an average income per family of maximum 1 minimum salary, and dwellings are precarious and do not have access to basic sanitation.

The community of Lagoa da Pedra, a *quilombola* community located 3,800m from one of the Project’s DAAs, falls in the vulnerability status.

Lagoa da Pedra Community

Lagoa da Pedra is a *quilombola* community, formed approximately 190 years ago, home to 37 families (approximately 180 people). The community has about 80 acres of land, demarcation and titling of which are pled with INCRA. In the community, subsistence crops (beans, maize, and cassava) are cultivated. Some owners are dedicated to cattle raising. The remaining *quilombolas* develop a community garden through a circular system (mandala method).

The community has only one multilevel school, where children go from grade one to four of elementary school. After this period the students study at the State School of Cana Brava. The community has electricity and running water.

An interview was conducted at Lagoa da Pedra with the President of the Association of Small Farmers of the community, Mr. Neres Francisco Machado.

Although it is not included in the directly affected area of PROJECT ARRAIAS, the Lagoa da Pedra Community could suffer indirect impacts caused by the Project's construction (employment, regional population influx and similar effects). The improvement of the quality of life of its residents could be cited as a potential positive impact. A potential negative impact may result from changes in socio-cultural relationships due to new activities and the increase in migrant population in the municipalities of Arraias de Campos Belos. Therefore, it is appropriate to implement a specific program for the Community, in order to mitigate negative impacts and maximize positive ones. Within the Quilombola Community Support Program, a survey regarding the community's tangible and intangible heritage will be conducted. The program aims to train the community for agrarian activities foreseen in the Support Quilombola Community Support Program.

5.2.3.4 Land Use

In 2006, the agricultural census registered 924 agricultural establishments in the city of Arraias, spread over an area comprising 228,358 ha, representing 34.5% of the total area of the city, as shown in **Table 5.2.3.4.a**.

Table 5.2.3.4.a
Area occupied by rural establishments in Arraias

Municipality	Total Area		Number	Establishments	
	km2	ha		Area (ha)	%
Arraias	5,786	578,600	924	228,358	34,5

Source: IBGE, 2010 – 2006 Agropecuary Census.

Based on the analysis of **Table 5.2.3.4.b**, the rural structure of the area studied is similar to state and national standards, where it is possible to observe a large concentration of land in few rural establishments and a high number of small establishments with a little fraction of land.

A group of 99 establishments, with areas ranging from 500 to over 2,500 hectares, concentrates 70.6% of the areas occupied by rural establishments in the city of Arraias, that is, 161,232 hectares. On the other hand, 380 small establishments, with area smaller than 50 hectares, occupy only 3.3% of the areas of rural establishments, totaling 7,651 hectares.

Medium-size establishments, with area between 50 to 500 hectares, represent 26.1% and occupy an area of 59,475 hectares of the total rural area, distributed in 326 establishments. This percentage of concentration of land in medium and large properties confirms the existence of ranches in the region, between 100 and 500 ha, and large land properties with over 500 ha.

Table 5.2.3.4.b
Rural establishments by area in the region of Arraias

Size	Establishment	
	Quantity	Area (ha)
Smaller than 1 ha	8	-
From 1 to smaller than 5 ha	64	203
From 5 to smaller than 10 ha	54	443
From 10 to smaller than 20 ha	86	1,285
From 20 to smaller than 50 ha	168	5,720
From 50 to smaller than 100 ha	115	8,837
From 100 to smaller than 200 ha	99	14,052
From 200 to smaller than 500 ha	112	36,586
From 500 to smaller than 1000 ha	45	31,240
From 1000 to smaller than 2500 ha	40	58,723
From 2500 ha and larger	14	71,269
Producer without area	119	-
Total	924	228,358

Source: IBGE - 2006 Agropecuary Census.

According to the 2006 agropecuary census, conducted by IBGE, the amount of use and occupation of land in the rural area of Arraias suffered losses in all categories. Such losses may be related to rural exodus, which thus leads to a larger concentration of land with fewer owners, because when they move from the rural to the urban area, the small producer often disposes its property. Therefore, those who remain, add more and more areas to their properties which become increasingly larger.

Table 5.2.3.4.c, shows that in the study area the predominant land use is associated with farming activity, as the pasture category covers 58.63% of the entire area of rural establishments, followed by categories woods and forests with 26.41%, agroforestry systems with 6.51%, degraded land with 4.82%, crops with 2.38% and 1.19% improvements in lakes and dams with 0.06%.

Table 5.2.3.4.c
Number of agricultural establishments by land use

CATEGORY	ARRAIAS / TO		Area of Establishments (ha)
	No. of Establishments		
	1995	2006	2006
Crops	452	373	5,425
Pasture	1,055	1,010	133,893
Woods and forests	553	410	60,311
Agroforestry	0	165	14,877
Lakes and Dams	0	27	113
Roads and Trails	0	504	2,726
Degraded land	621	170	11,013
Total	2,681	2,659	228,358

Source: IBGE - 1995 and 2006 Agropecuary Census.

Family Economy

The Family Economy is related to the concept of one or more individuals living in the same housing unit (houses, apartments, etc.), provided that the housing unit can be individualized by source of income (family budget).

Family Income Structure

Family income is a socioeconomic indicator widely used by IBGE to assess the living conditions of families. It does not consider particularities, such as average size and age composition. The downside of this indicator is that it ignores living conditions of each family and the individuals who compose it. Thus, the number of companies and therefore the number of formal jobs in a given region is used to infer the status of the family structure in economic terms. The higher the formal labor market, the better the economic condition of the family.

In 2006, according to IBGE, Arraias had 169 commercial establishments and 724 employed people, representing approximately 7% of the city's population, as seen in **Table 5.2.3.4.d**.

Table 5.2.3.4.d
Local companies by activity and personnel in 2006

National Classification of Economic Activity (CNAE)	Arraias-TO	
	Number of local units (Units)	Total individuals employed (People)
Agriculture, Livestock, Flowers expl.	7	12
Fishing	0	0
Extractive Industries	1	*
Transformation Industries	8	495
Production and Distribution of electricity	2	*
Construction	4	2
Commerce, repair and automobiles	97	159
Accommodation and food	10	17
Transport. storing and communication	5	5
Financial intermediation	2	*
Real Estate	3	4
Public Administration, defense and social security	2	*
Education	13	17
Health and social services	3	7
Other group services	12	6
Domestic services	0	0
International bodies	0	0

Source: IBGE, 2010 – Central Registration of Companies - 2006

Note: * less than 3 (three) individuals employed

5.2.3.5

Directly Affected Properties and Population

Field surveys have identified 49 properties in the areas and surrounding areas to be affected by the Project, in which approximately 120 people live. This finding reveals that most of these homes will be displaced as a result of the construction of PROJECT ARRAIAS.

The analysis of data from the field research conducted with 252 residents of the area studied in the municipality of Arraias revealed that 86.0% of the population has an average family income of no more than a minimum wage. Approximately 31% of the residents interviewed did not finish elementary school and, therefore, have less than eight years of schooling. 57.6% said they were residents for over ten years.

In Campos Belos, the data obtained by the field research revealed that 59.4% of people have average family income up to one minimum salary and 33.6% participated in the federal government program “Bolsa Família” as a way of complementing their income.

The data gathered by the field study reveals that 32.9% of residents interviewed did not finish grade school and therefore have less than 8 years of schooling. 47.6% of those interviewed have lived in the area for more than 10 years.

The main problem identified by the residents and local leaders with respect to the city of Arraias refers to the lack of employment, insufficient urban infrastructure and basic services, lack of equipment, poor health services, lack of job opportunities and public policies and roads in bad conditions.

With respect to problems in Campos Belos, the precariousness of public infrastructure was the principal negative aspect mentioned by the residents interviewed. In particular, the lack of equipment and poor health services were pointed out. Problems related to the lack of work opportunities were also mentioned.

The interviews revealed that there is no widespread knowledge among the local leaders and the community regarding PROJECT ARRAIAS of exploration and beneficiation of phosphate ore to be developed in the region by ITAFÓS. This indicates continued stakeholder engagement will be necessary, as proposed in the programs included in **Section 7**.

The interviews also revealed that there is a high expectation of the community interviewed in relation to the company, mainly due to the generation of job opportunities, income and improvement in quality of life. For these people, ITAFÓS can significantly improve the quality of life of residents of Arraias and Campos Belos, with jobs and the collection of taxes that will be generated with their construction in the city.

An interesting fact is that the survey revealed the community's concern regarding the possible environmental impacts caused by the Project's construction, particularly with respect to air and water pollution and the deforestation that may occur for the Project to be implemented.

The phosphate exploration and beneficiation Project in the region of Arraias will generate 249 direct job opportunities. Only this figure, excluding job opportunities that will be indirectly generated, represents 4.57% of the economically active population of the city of Arraias (in the range of 20 to 59 years of age; data from the 2010 national census), assuming these job opportunities are taken by local residents. This number is significant, considering that most of the respondents pointed unemployment as the main shortcoming of the city.

Regarding the municipality of Campos Belos – GO, the 249 direct job opportunities represent approximately 2.41% of the city's economically active population (in the range of 20 to 59 years of age; data from the 2010 national census), if these job opportunities are taken by local residents.

Socioeconomic Registry

To perform a detailed survey of the properties and their directly affected population, a Socioeconomic Registry was carried out.

A preliminary census with basic socioeconomic data was carried out, complemented with data referring to the use and improvements to buildings, affected areas, duration of residence, number of people and other pertinent observations through questionnaires and informal conversations with residents.

People to be displaced were classified with respect to the rights acquired on the property as:

- (i) Having formal legal right to the occupied land, or
- (ii) Not having formal legal right to the land, but whose claim is recognized or could be recognized by Brazilian law.

Another way of classifying people to be displaced by the project is by their social and economic profile, as vulnerable and non-vulnerable. For this definition, the economic status and degree of knowledge of individuals which form the community studied.

- **Vulnerable:** poor families, with many children, that in a large majority are illiterate or graduated only the first few grades in school. They typically do not know their rights and responsibilities as citizens. They depend on social programs from the government and third parties for a basic basket, and other help, and their property also has little or no infrastructure.
- **Non-vulnerable:** Families few in number, with medium to high acquisition power, whose parents have not studied much, the children have graduated or are about to

graduate. These individuals know their role as citizens, do not depend on social programs, and live in buildings with good structures and in good conditions

Analyzing the information gathered during the preliminary census, the characteristics of the properties impacted were seen to be fairly similar. However, there are property owners in the group that exert other activities or have other income that does not depend exclusively on the property impacted by the project.

In this sense, 47 property owners and 2 impacted occupants can be pointed out that use their areas in a very similar way, carrying out activities that count on labor of the family for its subsistence. The principal agricultural activities are related to cassava, rice, beans, and corn crops, and many times there are small orchards that offer various fruits. The pattern does not change with respect to raising animals, mainly poultry for personal consumption, followed by mixed cattle ranching (for meat and milk), pigs, and goats.

Of the 47 properties (including the 2 occupied areas) only 13 will be affected in a proportion above 50% of their area. This proportion does not mean much however, since none of the properties uses their area completely. Depending on the part affected, productive activities of the property could be compromised with respect to their viability. A definitive analysis will therefore be done to base the forms of negotiation that should be proposed, according to its characteristics of each landowner.

8 properties were considered physically not viable because of physical restrictions on the majority of their area. The rest will suffer impacts on production or productivity, which could make activities unviable, reinforcing the premise that the procedures should be evaluated individually to promote a better solution for each case.

Even though it is preliminary, among the areas that are meant to be acquired, it is presumed that a friendly relationship will not be reached in the four cases where technicians were not allowed in. So, although the form of acquisition was not definitively determined, it is possible to estimate that these four cases will be acquired by Type I, from a land acquisition transaction according to the definition from the “*Performance Standard 5: Land Acquisition and Involuntary Resettlement, of the IFC*”.

According with the preliminary census analysis, among the property owners interviewed, 23 were considered non-vulnerable and 15 vulnerable. 33 property owners have formal legal rights to the land occupied (i), and 5 do not have formal legal rights to the land occupied, but whose claim is recognized or could be recognized by national law.

Although the preliminary census has established the status of those impacted as “i” or “ii”⁽¹⁾, a deeper analysis of each case is necessary because Brazilian legislation recognizes squatters rights on private land, but impedes the acquisition of rights on public areas (patrimony of the Union.) Therefore, some of those impacted classified today in group “ii” could come to be reclassified in group “iii” if the documentation of the area is contested by INCRA if it undertakes future georeferencing.

Negotiations should be done by a team that understands the socioenvironmental character of the actions to dislocate people that live and use the areas (often for generations), beyond just being capable of negotiating, due to the humble background of those impacted. They should be guided and helped to achieve the conditions to reconstruct their productive activities or their subsistence conditions, and indirectly their own lives and social relationships.

The Registry shows that 47 properties will be affected by the project. Among them, two have squatters, totaling 49 negotiations. Of these 49, three were already acquired by Itafós. Eight (8) entries of these properties do not contain information on families and residents due to their refusal to answer or because they were not found. 38 have complete registers, of which there are 36 families totaling 126 residents.

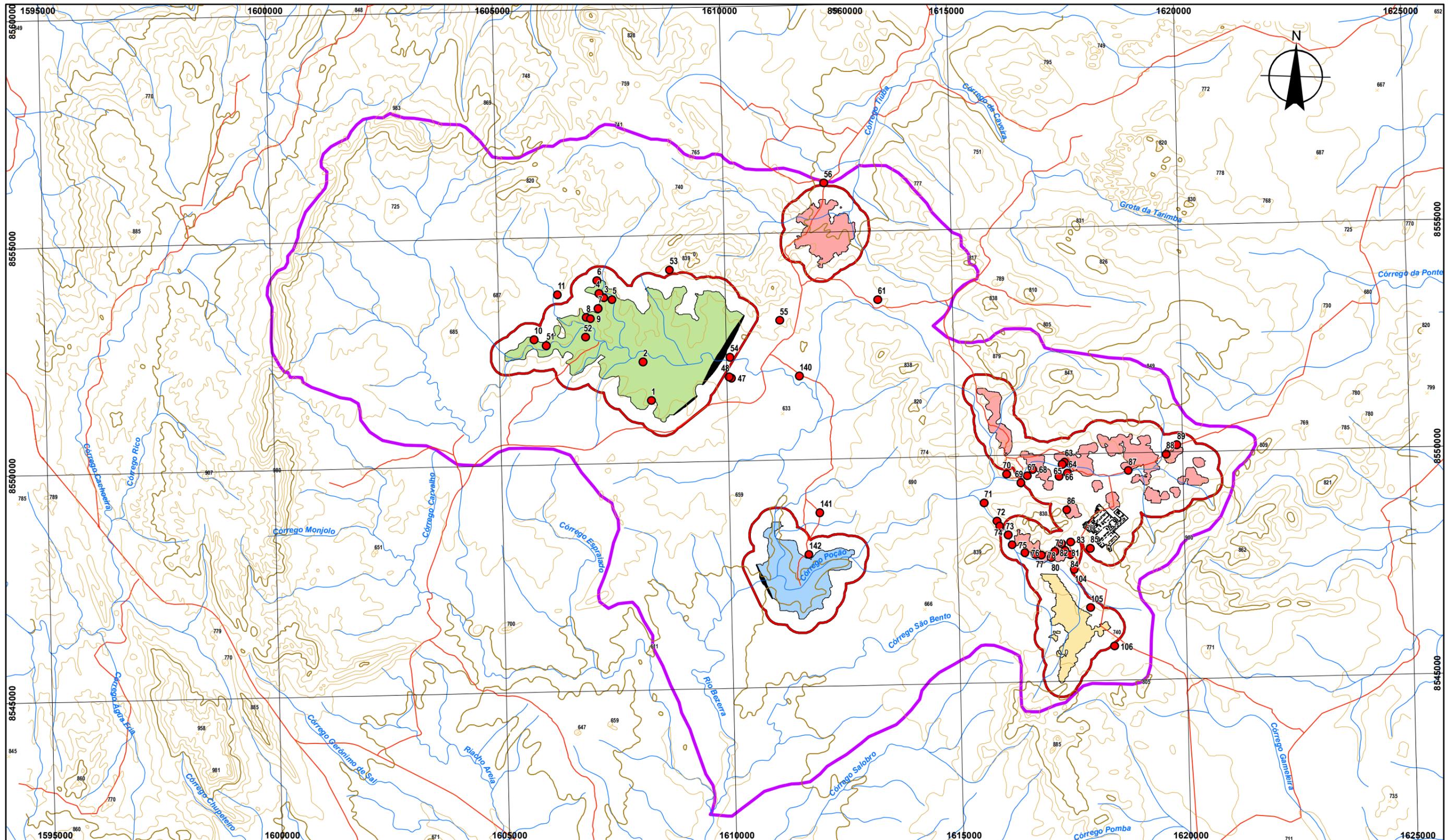
The information collected during the socio-economic filed survey is shown in the tables below:

Table 5.2.3.5.a
Properties already negotiated by Itafós

Name of the property owner	Land area (ha)	Affected area (ha)	Affected area (%)	Negotiation status
Itafós mineração ltda	155.09	0.49	0.3%	concluded
Itafós Mineração Ltda	57.24	4.03	7.0%	concluded
Itafós Mineração Ltda	1555.50	57.02	3.7%	concluded

Source: Relatório de Avaliação Social - Itafós Mineração Ltda. - Arraias - TO

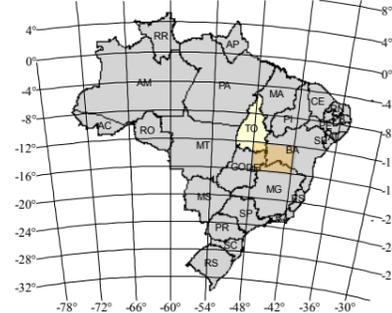
⁽¹⁾ “i” which has formal legal rights to the land occupied; (ii) which does not have formal legal rights to the land, but whose claim is recognized or could be recognized by Brazilian law.



LEGEND:

- Areas with Buildings
- x Elevation Points
- Master Curves
- Intermediate Curves
- Hydrography
- Roadways
- Industrial Plant
- Dams
- Directly Affected Area (Physical Environment)
- Direct Area of Influence (Physical Environment)
- Water- Catchment Dam
- Tailings Dam (3-20 anos)
- Mining Areas (0-5 anos)
- Mining Areas (>5 anos)

LOCATION ON THE SHEET



Source: Information obtained from environmental Impact Assessment - July 2010

INFORMATION

Scale: 1:80.000
0 0,375 0,75 1,5 2,25 3 3,75 4,5 km

Projection - Universal Transverse Mercator - UTM
Geodesic Reference System - South American Datum - SAD 69

Date: 01/04/2011 Fig. JGP: Figure Edificações.mxd

CLIENT:



PROJECT:

PROJECT ARRAIAS

FIGURE 5.2.3.5.a:

MAP OF AREAS WITH BUILDINGS IN THE DAA



JGP Consultoria e Participações Ltda.

Table 5.2.3.5.b
Proprieties affected without registry information

Name of the property owner	Land area (ha)	Affected area (ha)	Affected area (%)	Operations
Jonas Tadeu Marques	175.7	31.2	17.80%	not found.
Maria Emília Ayres França	754.51	32.72	4.30%	Did not allow Access and did not respond
Domingos José Santos Junior	884,84	28,06	3,2%	Allowed access but did not respond
Antônio Ayres França	1477,40	53,37	3,6%	Did not allow access and did not respond
João Carlos Pereira Santana	103.83	17.84	17.20%	not found.
Márcio Araújo Oliveira	119.99	2.64	2.20%	Did not allow Access and did not respond
João Batista Rodrigues dos Santos	20.07	20.07	100.00%	not found.
Valduino Ramalho dos Santos	189	82	43.40%	not found.
Total = 8	3725,3	267,9	7.19 %	

Source: Relatório de Avaliação Social - Itafôs Mineração Ltda. - Arraias - TO

Table 5.2.3.5.c
Properties affected according to vulnerability and negotiation status

Item	Families considered vulnerable		Families considered non-vulnerable	Total
	Squatter or person with CRI	Squatter or person who acquired the land, but does not possess the CRI		
Number of properties	10	5	23	38
Number of families at the location	10	5	21	36
Number of people	32	14	80	126
Land Area (ha)	80.96	20.89	8621.39	8723.24
Affected area (ha)	41.64	12.65	1345.36	1399.65
Affected area (%)	51.43	60.56	15.60	16.05
Status	i	ii	I	i and ii
Compensation rights	Yes	Yes	Yes	Yes
Negotiation status – started*	0	0	2	2
Negotiation status – concluded	0	0	2	2
Negotiation status – not started	10	5	19	34

Source: Relatório de Avaliação Social - Itafôs Mineração Ltda. - Arraias - TO

Obs: (i) which has formal legal rights to the land occupied;
(ii) which does not have formal legal rights to the land, but whose claim is recognized or could be recognized by Brazilian law.

*Negotiations were already started in two properties which could not be registered in a complete cadastre yet.

5.2.3.5.d

Number of families and residents to be affected by the Project

	initial 5 year period	20 year period	Total*
Total number of properties	25	22	47
Number of registered properties	18	20	38
Number of registered families	17	19	36
Total number of residents registered	56	70	126

* Two cadastre registers correspond to properties occupied by squatters, meaning an actual total of 49 properties.

The Property Acquisition and Compensation Program will be responsible for conducting this negotiation process with the affected population, paying attention to where the relocated residents go and how they use their compensations. For this, a Resettlement Action Plan was created within this program.

In **Figure 5.2.3.5.a**, it is possible to observe the affected properties on the Map of Built-up Areas in the ADA.

5.2.4

Cultural and Archeological Heritage

Methodology

The field study took place from June 11 to 19, 2010. The research strategy aimed to evaluate portions of areas that require licensing through the path analysis and observation of the land surface (extensive surface exploration), and to gather information from the local rural population, to establish the archaeological potential within the areas that will be affected by the Project.

In the field work, the satellite image *Worldview -2* was used, with 50 cm resolution, imaged on March 28, 2010, provided by the contractor and topographic map from DSG, in the scale 1:100,000. In the field, the team received support from the contractor regarding the general information about the Project, which also focused on issues of access to areas to be intervened.

Landscape reading was used to identify environmental variables that could reveal past human use, as defined by Kashimoto (1997) as well as the methodology adopted by Araújo (2001) for research in broad areas.

The procedure adopted for the archaeological survey of the different areas was the land scan through systematic path analysis attempting to identify points with archaeological visibility for observation (areas with exposed soils due to human action and/or natural actions such as land cuts, access, carriers in the middle of the planting area, holes derived from bioturbation and so on). Special attention was given to places where the rural properties are cut by drainage channels, such as rivers, riverbanks and streams in order to verify the presence of remains protruded on the surface.

Twelve units were set to prospect (UPS), which were systematically assessed by means of surface scan. It is worth pointing out that the UP-12 corresponds to a single point of UTM coordinate provided by the contractor, which was properly investigated, considering a scanning radius of 200 m from it.

Results

The procedures adopted have led to the identification of 16 archaeological sites, 16 occurrences and two areas of historic occupation in the areas under examination, totaling immediately 10 areas of attention. Out of this total, 14 sites and 8 occurrences were found in the area directly affected (ADA) by the Project.

The places where we detected the presence of three or more pieces at a maximum distance of 10 meters were considered archaeological sites, and the archaeological manifestations that do not meet these conditions are denominated "isolated archaeological occurrences" (OCs), as proposed by Araújo (2001: 155).

The isolated pieces located within a maximum radius of 30 meters of each other were encompassed in a single Archaeological Occurrence, for purposes of description, even though these parts may be related to different cultural phenomena. The importance of these events can not be underestimated, since they are potentially informative with respect to places where specific activities occurred in the past, being fundamental for the development of interpretations on a regional scale.

The historic occupation areas (HOA), in turn, are characterized by physical evidences associated with the occupation of the region from the second half of the twentieth century. The regional approach attempted here must necessarily take into account these occupations, since they reveal a way of life little documented and analyzed by means of material culture, in the process of profound transformation and disappearance. Accordingly, the appropriate measure is the documentation of the vernacular nature structures identified and the selective collection of material evidence.

The complete report of the Archaeological Non-Interventive Diagnostic of the phosphate exploration and beneficiation Project in the region of Arraias/TO is presented in ANNEX 10 of the ITAFÓS MINERAÇÃO LTDA EIA document (PROMINER PROJETOS Ltda & AMBIENGER ENGENHARIA AMBIENTAL Ltda., 2010). This document includes all considerations regarding the archaeological potential of the study area, also based on elements available in the analytical bibliography. The report was submitted to the proper appreciation of the State Superintendent of IPHAN in the State of Tocantins, according to the document presented in ANNEX 10 of the ITAFÓS MINERAÇÃO LTDA EIA document (PROMINER PROJETOS Ltda & AMBIENGER ENGENHARIA AMBIENTAL Ltda., 2010).

5.2.5

Complementary Baseline Surveys

Further to the environmental and social baseline conditions described in Sections 5.2.1 through 5.2.4 herein, the following complementary baseline surveys are under development in order to enrich the ESIA baseline:

- **Geotechnical survey plan**

In order to identify geological-geotechnical structures and features associated to karst relief and verify the geotechnical behavior of the area of the industrial plant and the mining areas, geophysical studies and a campaign of rotating probe studies will be carried out before the project's implementation. The geophysical survey will embrace electrical resistivity tests by means of vertical electric sounding (VES) and electrical profiling, possibly complemented by microgravimetry tests. This will seek to identify any cavities or other features associated to karst formations that may require adjustments to Project engineering or that may pose specific risks during progress of earth moving or mining activities

- **Complementary fauna surveys**

Additional fauna surveys will be carried out for all terrestrial fauna groups and for semi-aquatic fauna in order to bridge gaps in the baseline and improve current knowledge of the fauna in the Project's area of influence and to obtain more information about the use of the Project Area by sensitive species whose occurrence was evidenced during the ESIA studies (particularly the Pfrimer's Parakeet, *Pyrrhura pfrimeri*). These surveys will include 14 sampling areas for all terrestrial fauna groups except bioindicator insects (Hymenoptera), including 6 areas at the DAAs of different project components (Canabrava, Domingos and Coitê mining groups; Industrial Unit; Water Catchment and Tailings reservoirs), 6 different areas covering different parts of the Project's DAI and two areas outside the DAI for use as control points. Specific sampling points for each group will be defined at the time of the campaigns. For the hymenoptera, surveys will include 3 points at the Poção Creek, 5 points at the Bezerra River and 3 Control points at the Bezerra River upstream from the planned

Tailings Reservoir. For semi-aquatic fauna, these surveys will include streams at the DAA for the Canabrava mining area and the water catchment and tailings reservoirs, as well as the Bezerra River upstream from the reservoirs for use as control points. These surveys will be carried out prior to the project's implementation.

- **Complementary biospeleological survey plan**

Identification of all fauna collected in caves during ESIA development will be completed to species level before construction begins. If any endangered, endemic or new or unknown species are confirmed, an assessment of how each can be affected by the project will be conducted and this may affect the design of the complementary biospeleological survey plan.

Complementary surveys of cave fauna will be done during construction for both invertebrates and bats in order to obtain data representative of the fauna communities of each one of the natural cavities present in the project area and the seasonal differences in communities' composition and in the abundance of different fauna groups. These surveys will be carried out in both the dry season (June, July, August and September) and the wet season, with a minimum 4-months interval between campaigns. Invertebrate sampling will use active searches, Winkler sampling and pitfall traps with baits and formaline; for bats, the sampling will use mist-nets. Bats and invertebrates collected during the surveys will be included as voucher specimens composing a reference collection, which shall be deposited in recognized scientific institutions.

- **Malaria transmission potential assessment and control plan**

Surveys of the potential for malaria transmission at the project area will be conducted by means of three seasonal field campaigns, including the use of the Shannon trap methodology for the collection of adult individuals and sampling by dippings in waterbodies during daytime for the collection of larvae. These surveys will include breeding areas within the DAA (prioritizing the DAA of the water catchment and tailings reservoirs, as well as the area where human presence is expected to be highest). Data obtained will be compared with bibliographic information and provide a characterization of the area with regard to transmission risks for malaria and other regionally relevant vector-transmitted diseases. An assessment of the potential for malaria will be submitted to the Ministry of Health (*Secretaria de Vigilância Sanitária – SVS*) as required by local legislation. Based on this assessment, a Malaria Control Plan (PACM) will also be prepared and submitted. SVS approval of these documents is a condition precedent to construction start-up.



- **Survey of Downstream Water Users**

A survey of the use of water by communities downstream of the Tailings and Water Catchment Reservoirs in the Project's DAI and IAI (including Campos Belos) will be carried out before the Project's implementation. This will allow for identification of potential impacts and risks to downstream water users that may be affected by the Project during the construction and operation phases.