

## **Environmental Sensitivity of the inhabitants in the Tazekka National Park (Morocco)**

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### **Abstract**

This article addresses the issue of environmental education in relation to the sustainable development of the natural resources of Tazekka National Park (TZNP). Its overall objective is to evaluate the actions carried out in the field of education, sensitization and development in the park, to contribute to the conservation of its natural resources through the environmental education of the neighboring populations. Its methodology is based on an investigative and analytical approach. In fact, the practices, the activities and the exploitation behaviors of the natural resources carried out by the local population reflect their level of sensitivity to the environment. Our investigation has shown that the park's population has a certain maturity and awareness of the environmental issue, despite their dependence on its natural resources.

**Keywords:** Environment, education, evaluation, awareness raising, sustainable development, national parks

## 1. Introduction

In Morocco, the environment is under severe stress due to population growth, urbanization and economic development needs, these constraints adding to climate variability leading to a deterioration of the natural environment and harming the health of people and life quality.

Like the international community, Morocco is engaged in the process of sustainable development and preservation of the environment. It has ratified more than 60 international and regional environmental conventions, and adopted the declarations of Rio Summit 1992.

These include Agenda 21 and the United Nations Framework Conventions on Biological Diversity, Combating Desertification, Drought, and Climate Change. It is in this context that Morocco hosted the COP22 in Marrakech in November 2016.

This shows a willingness to take into account the protection of the environment at the top of the occupations of the state.

Aware of the need for the conservation and protection of its ecological environments, since 1930, Morocco has embarked on a strategy of networks of protected areas, including parks and nature reserves through the proliferation of a set of laws governing national parks (state secretariat for water and the environment, 2016). A total of 10 parks and 146 reserves with unique ecosystems have been created.

The Tazekka National Park, object of our study, was created in 1950 by Visiriel Decree of July 11, on an initial area of 680 hectares. His main objective was to protect all existing natural resources at the top of Jbel Tazekka, and more especially the cedar forest (*Cedrus atlantica*), which is isolated on this peak. His interest is in order to:

- Botanic: the maintenance in particular of the cedar islet, which testifies to the extension of old-growth forests of a particular essence of North Africa;
- Touristic: beauty of the trees and remarkable views of the Taza corridor, the plains and the surrounding mountains;
- Scientific: ecological and genetic research on species.

The decree of 8 October 2004 decided to extend the park to include other natural areas of undoubted ecological and recreational-educational importance (floristic diversity, cork oak forests, holm oak, zen oak in particular, eco-tourism sites): chasms and caves, waterfalls, picturesque rural landscapes, ...).

The expanded park area currently consists of 3 zones subject to different regimes:

- Zone I: Protected Natural Areas (PNA) 1,115 ha including the 680 ha of the current park,
- Zone II: Managed Natural Sanctuaries (MNS) 2,497 ha,
- Zone III: Natural Resources Management Area (NRMA) 10,125 ha.

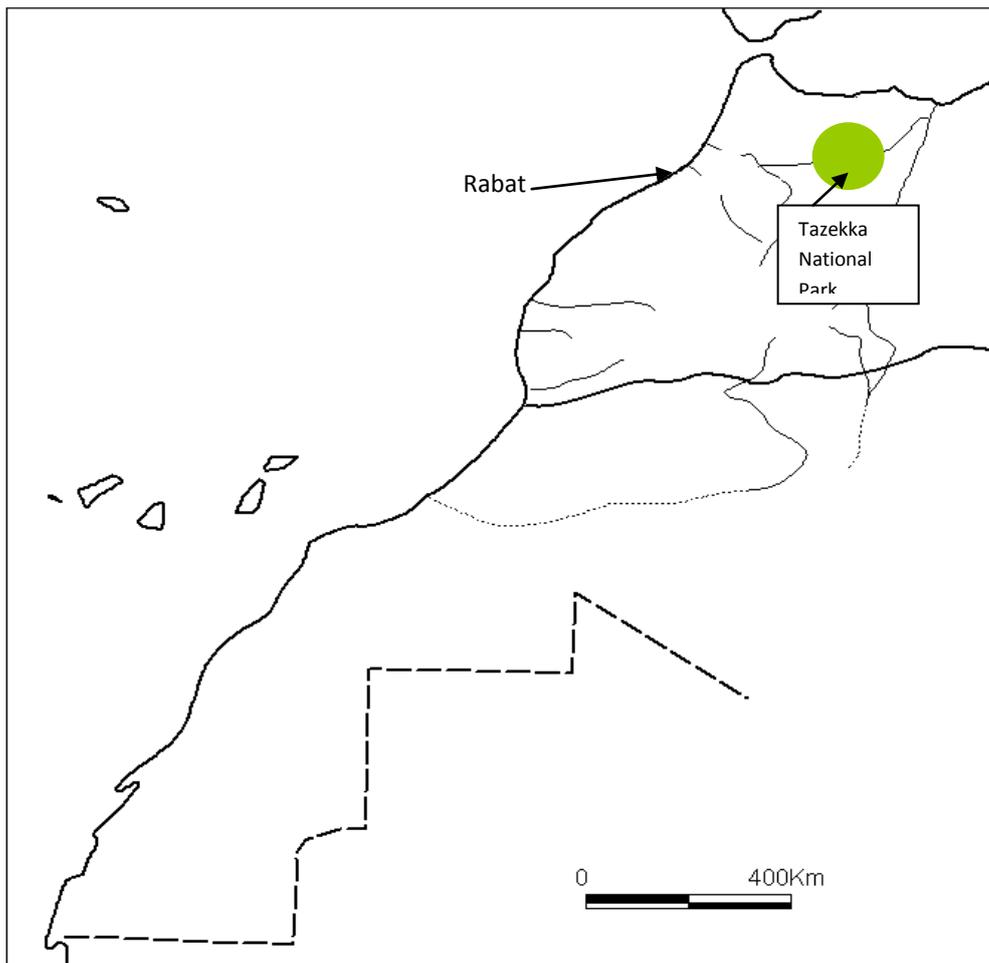
The Tazekka National Park (Map 1), located a few kilometers from Taza city, lends itself well to the study of this problem. Indeed, it is an area where society remains attached to an agro-pastoral system which is not condign with the natural environment characterized by visible fragility. This situation is at the root of a trend towards an ecological imbalance that is becoming more and more alarming.

Why, despite Morocco's commitment to a global environmental preservation policy, the situation remains unchanged?

Can environmental education be considered as an alternative or essential means for successful environmental policies?

Can we take into account the views of the local population, the Tazekka National Park, and influence the decision-makers by concretizing possible reflections, which can sensitize and make react future generations?

We will also analyze the role of associations as actors in the implementation of environmental education.



*Map 1. The location of Tazekka National Park.*

## **2. Material and method**

With the demographic explosion, the technical progress and the development of invention, the relationship between man and his environment is beginning to be complicated. According to Tissier (1998) "the problems related to the environment come from the attitude of behavior of individuals whatever their level within their societies".

Man has caused the desertification of some regions caused by deforestation and depletion of agricultural land due to:

- Intensive agriculture,
- Soil and water pollution due to fertilizers and rejects of all kinds.

These manifestations have effects on the quality of life, in the form of a regression of biodiversity, causing situations of impoverishment, as well as social transformations. Although the bibliography related to the studies already carried out is able to provide valuable information on the state of awareness, protection and sustainable use of natural resources, it was necessary to deepen the analysis by the survey of local stakeholders, conducted during the spring and summer of 2010.

The field survey is used to evaluate the outcomes of the environmental education strategy through two aspects:

- the practices and activities carried out by the local population in the behavior of exploitation of natural resources: water, rangelands, forests,  
 - the sensitivity of the local population, by answering a certain number of questions: Is the population sufficiently informed about the environment? Is that one of his concerns?  
 The answers to these questions will reflect the opinions, proposals, and solutions to help improve environmental education.  
 The survey completed 100 questionnaires to the out-of-school population, spread over the 15 Douars of the 3 communes among the 6 covering the park.  
 The table below gives a summary of the distribution of Douars and communes visited. (Table 1)

**Table 1. The Douars concerned by the study**

Communes	Douar	Number of investigations
Bab boudir	Ain Bechar	5
	Béni smane	2
	Ain khebab	4
	Chiker	4
	Sidi slimane	3
	Arwa	3
	Aheshas	4
	Negret	15
	Sidi mejber	17
	Ras elma	6
	Aghil	16
	Egram	5
	Ain bechar	4
Bou chfaa	Bab azhar	5
Asmiaa	Elbhayer	7

The main results from the surveys carried out can be drawn in the following sections.

### 3. RESULTS AND DISCUSSIONS

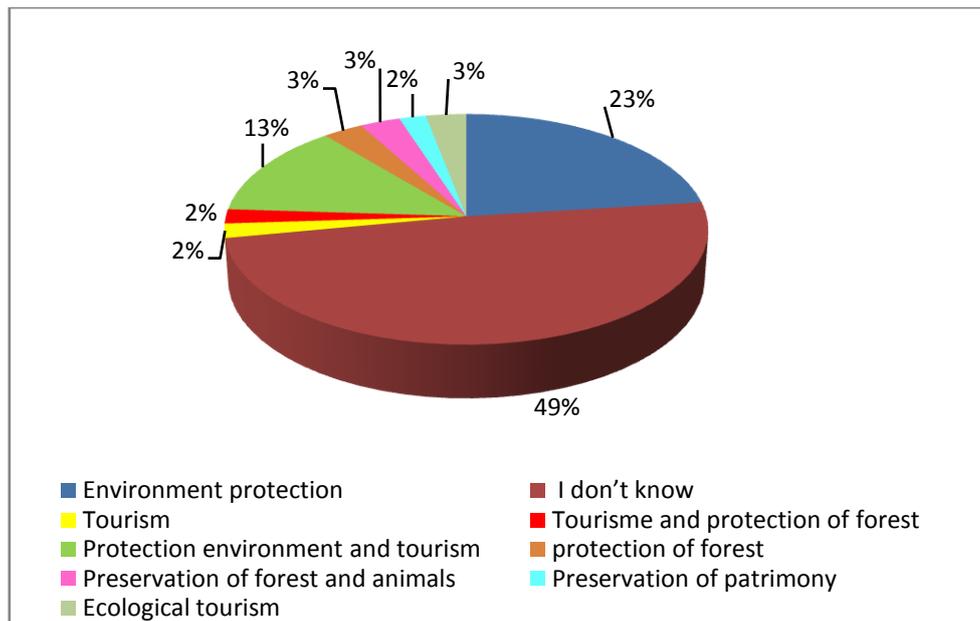
#### 3.1 Are people in TZNP worried about their environment?

Regarding the subject of people's awareness of their presence in a national park, 72% of those who answered the questionnaire are aware of their presence in a national park, compared to 28% of people who are not.

According to Nachid (2005), the role of a national park has three objectives:

- Conserving, rehabilitating and enhancing natural and cultural resources,
- Contribute to sustainable local development, reconciling the imperative of conservation with the needs of economic and social development,
- Promoting awareness and increasing the sensitivity of actors and visitors through an awareness and environmental education program.

Our study shows that 49% of respondents do not know the role of the national park. 23% define the role of the national park as a place of protection of the environment. 13% considers it a place of protection environment and tourism, the rest of the respondents consider the park as a place of tourism, protection of forests, and preservation of animals (figure 1).



**Figure 1. The reaction of the local population towards their environment**

### 3.2 The geographical distribution of the population on the park and its impact on their awareness of the preservation of natural resources.

Khattab (1999) defined environmental sensitivity as a sense of responsibility towards the environment, which is why Man is called to realize this responsibility through his actions. The challenge of protecting the environment from the water and forest administration and the subsistence obligation of the local population is ambiguous and difficult.

It has been clearly demonstrated in our research that there has been an opposition between economic and ecological interests, given the poverty of the region, because the satisfaction of different human needs leads to the overexploitation of natural resources.

The field survey revealed that the places where people live reflect their level of awareness of the environment.

In the field of forest exploitation for example, the majority of the population has only the forest as a source of income and food, it is difficult to ask them to take care of the protection of the environment by minimizing their catch, without offering them other alternative resources. The communal center of Bab Boudir, located next to a forest bearing the same name, is considered Zone I, where any act of cutting or grazing is forbidden. The forest remains inaccessible to the population, whose way of life is characterized by an economy of subsistence based on low livestock and arboriculture. Relations with the administration is not good or almost non-existent. The center of Bab Azhar, classified Zone II, is also located a few meters from a forest that remains inaccessible, its lifestyle, as for the center of Bab Boudir, is also based on a subsistence economy based on a weak breeding and on arboriculture. The population, aware of its presence in a national park, and the degradation suffered by the forest, even if it has never benefited from a training session, and considers that its relationship with the water and forest services is bad. The inhabitants of Douar de Sidi Majbeur are no more positive in assessing their relationship with water and forest services as bad, since they are not involved in any activity related to the exploitation of the forest.

On the other hand, the inhabitants of Dayat Chiker, considered as a zone III situated far from the forest, own arable land, allowing them a standard of living more or less comfortable. Their

subsidence activities are varied and based on arboriculture, a varied agriculture, livestock, and tourism (guided tours of the caves of the region). They express that their relationship with the water and forest services is good or there is no relationship between them.

All this confirms that conflicts of interests between exploitation and protection engender a kind of antagonism between the operators and the water and forest administration, each considering the other as a potential competitor or even an adversary.

The geographic location of the population in the areas of Zone I, Zone II, Zone III is a factor influencing the population's actions towards the park and the sustainability of the resources.

### 3.3 The reaction of the local population towards their environment

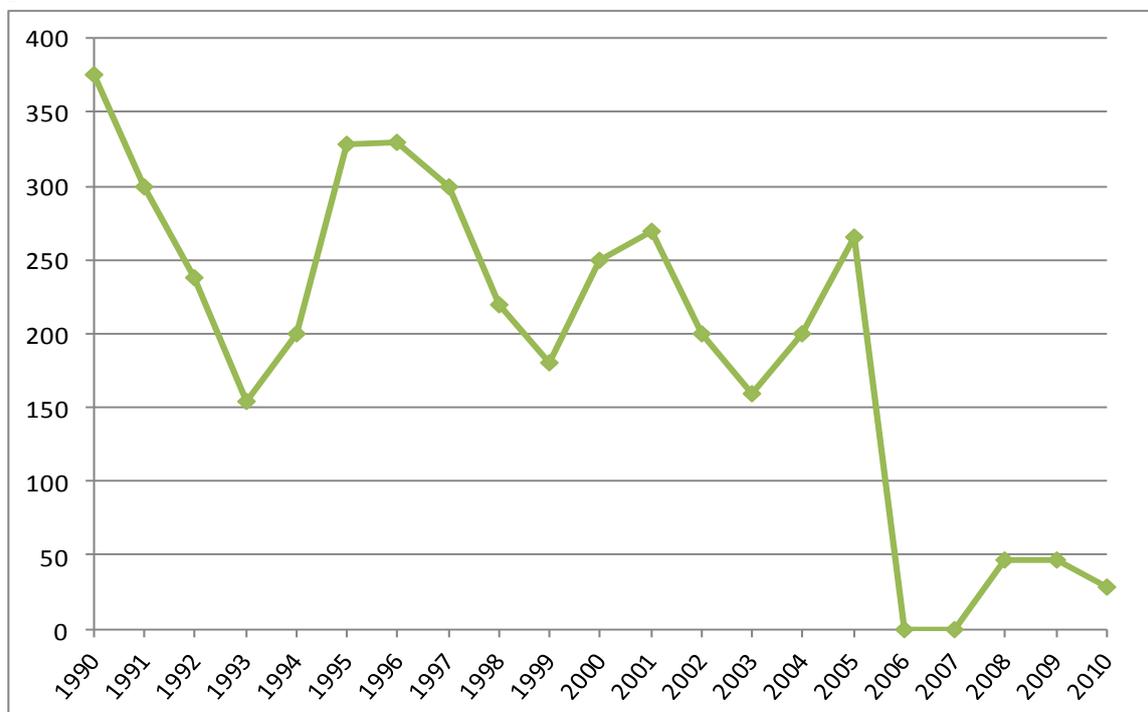
The relief of the TZNP consists mainly of slopes, sharp peaks and narrow and very deep valleys, especially in its western part. As a result, farms and cropland are limited. The park is made up of six rural communes, whose main activity is livestock, whose diet is based on pasture inside and outside the forest.

Faced with these difficulties and to meet its needs, the population is moving towards the forest to:

- Deforestation to expand cultivated plots.
- Cutting the wood to warm up or sell it or turn it into charcoal.
- Lopping and pruning trees.

These practices cause a severe degradation of the Tazekka forest.

In addition, the studies carried out by the Department of Water and Forest of Taza, estimates the consumption for each person in 2 tons of firewood per year in the Douar upstream of Admam 1500m, and 1.5 ton in the downstream of Bab Azhar 850m (High Commissioner for Waters and Forests and the fight against desertification, 1996) The following diagram explains the fluctuation in the number of offenses.



**Figure 2. Trends in the number of offenses committed between 1990 and 2010 in Tazekka National Park.**

The majority of these offenses are cutting of live wood or, fires, grazing, plowing in the forest (encroachment).

Generally, offenses recorded in the park have decreased from 376 offenses in 1990 to 28 offenses in 2010.

While the rate of decline is not progressive, but rather irregular. For example, in 1993, water and forestry officers recorded 154 offenses, but in 1995, the offense rate increased to 328 offenses, and in 2003 it decreased to 159 offenses, the years 2006 and 2007 were recorded 0 offense, these figures should be taken with caution.

The variation in the number of infringements is due to the vagaries of the weather, as in the dry years the forest becomes more and more frequented by the local population to meet their needs. In addition, the legislation is not so applicable.

We cannot hide and manipulate the interests of the residents, the results of the interviews highlight: 17% of the population believe that their interests are affected by the park. Especially at the level of grazing and 7% of respondents consider their relationship with the technical services of water and forests not good or bad, against 48% who consider good, and 45% say that there is no relationship with these services.

### *3.4 What is the level of environmental sensitivity of the inhabitants of TZNP?*

The Tbilisi Conference in 1977 proposed this definition of environmental education: it is a civic education that aims to "bring individuals and communities to understand the complexity of the natural environment. Created by man, complexity due to the interactivity of its biological, physical, social, economic and cultural aspects". In the same context, the ultimate goal of environmental education is to enable individuals to perceive the complex nature of the environment and the need for nations to adapt their activities and work towards development through means in harmony with the environment.

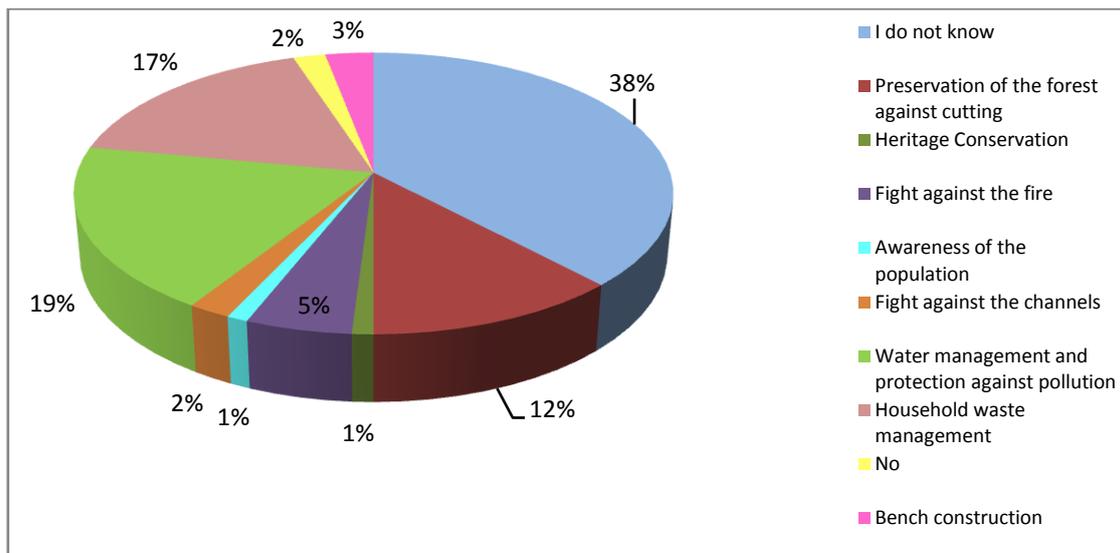
The field investigation showed that 98% of the people who answered the questionnaire consider their level of environmental information quite interesting; in addition the environmental question occupies a big part of the concerns of 96% of the respondents.

Like all Morocco, TZNP is undergoing degradation due to the growing needs of the local population.

The population is also aware of the phenomena of environmental degradation; all of the respondents recognize the existence of the progressive degradation of natural resources at the park level. The analysis of the results of the investigations revealed 13 environmental issues, first of all it is noted that 21% of the opinions announced the problem of floods, which relates mainly to torrential rains, while 15% find that desertification is the key issue, with pollution and climate change ranking third with 9 to 10 percent of responses.

### *3.5 Are the inhabitants of TZNP engaged in the action?*

The study showed that 38% of respondents do not know how to participate in the conservation of the environment, while 62% say that the environment is an area where their actions can make a real difference, by using traditional practices to fight against erosion and the closing of channels. In addition, they can act at the level of the economy of the water and protection against pollution (figure3).



**Figure 3. The respondent's attitude toward the environment**

Emphasized by the Development Cooperation Working Group (Development Cooperation of the Organization for Economic Co-operation and Development, 2001), "The problems of poverty and environmental degradation are intertwined, mutually affecting each other, and therefore need to be addressed together" this was supported by the responses of our respondents.

98% say that their living conditions do not help them to protect the environment; this was justified by poverty, the lack of economic activities outside the forest.

They almost all have the same feeling about regression of the canopy, when asked: How many trees are lost in a year? (In tree numbers or in hectare), 56% of those who answered the questionnaire reported losses that did not exceed 100 trees, 21% think that these losses are between 100 and 1000 trees, while only 12% estimate that this can exceed 1000 trees annually.

In relation to the reasons that contribute to the degradation of the forest.

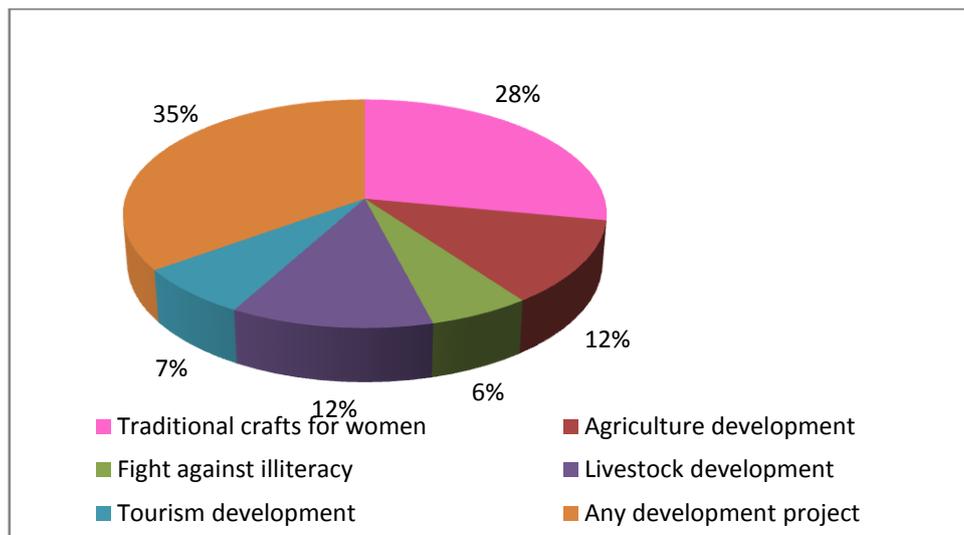
Poverty and overgrazing occupy respectively the first position with 27% and the second with 23%, the other reasons relate to natural causes (wind, snow, torrential rains).

According to 20% of the respondents, the forest can only be regenerated after the age of 20, while 27% estimate that the regeneration period is between 5 and 10 years, whereas for 21% it is under 5 years old.

### 3.6 What do the inhabitants of TZNP propose?

When proposing that respondents identify their solutions to protect the environment, it appears that. Nearly 6 out of 100 (6%) are in favor of regulatory measures. They want the legislation to be both stricter and harsher on the wrongdoers.

On the other hand, 100% of the respondents favor the idea of increasing the general awareness of the environment, and the need for the intensification of awareness campaigns and training sessions in order to preserve the environment. The sessions in the park are characterized by a low rate of beneficiaries, we note 9 out of 100 participated in training sessions: planting olive trees, intensification of breeding environment and ecotourism, forest conservation and goat farming.



**Figure 4. Suggestions for protecting the environment according to the respondents**

The people surveyed unanimously agree that the protection of the environment can only be achieved through the implementation of more structured development projects to improve the living conditions of the population.

35% of respondents agree on the need for the implementation of projects without specifying their nature. The handicraft projects for women come in second position proposals of the local population (28%), followed by the idea of the development of agriculture and livestock (12%). while 6% emphasized the fight against illiteracy (Figure 4).

#### 4. Conclusion

Located in a very rich ecological region, dominating TAZA corridor, the plains and the surrounding mountains, the TAZEKKA national park plays an important role as well of ecological order, by contributing to the preservation of the forest notably the cedar, which allow scientists to develop ecological and genetic research on fauna and flora species.

Unfortunately, many problems and difficulties hinder the sustainable development of the natural resources of the area, including the dependence of the population on forest resources (wood, fodder,). According to the study of Qarro (2000), there is an overgrazing rate of 0.28. That is mainly due to the increase in the number of small livestock that offset the decline in livestock. The forest is the only source of livelihood for the local population, who do not engage in income-generating activities such as ecotourism. It is an area where the society remains attached to an agro-pastoral system, which is not in adequacy with the natural environment characterized by a visible fragility.

Despite illiteracy, the population has practiced techniques encouraging the conservation of natural resources, as examples: transhumance, the fight against ravines, water management, household management and the fight against fire.

Thus, it is hardly a lack of knowledge of the risks of the excessive exploitation of natural resources, which accentuates the ecological problems, but rather the socio-economic conditions of the local population and the pressure that is exerted in view of the fact that the forest is the only source of livelihood in the face of a lack of complementary socio-economic activities.

The survey, which is the subject of this article, allowed describing the opinions and the behavior of the local population, concerning the problems related to the environment.

98% of the respondents, out of the out-of-school population, consider that their living conditions are unfavorable to participate in the conservation of the environment, while only 2% confirm that their living conditions help them to preserve the environment. 100% of those surveyed share the idea of stepping up awareness campaigns and training sessions to protect the environment. And compared to the need to enforce laws to protect the environment, 94% of people are against it.

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