

**"MY LIVING AND WORKING ENVIRONMENT– MY  
HEALTH"HEALTHY PLAN-IT™ PROJECT OF  
THE TEAM PaO<sub>2</sub>  
Belgrade, January 2006.**

PaO<sub>2</sub>

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# "MY LIVING AND WORKING ENVIRONMENT– MY HEALTH" HEALTHY PLAN-IT™ PROJECT OF THE TEAM PaO<sub>2</sub>

## 1. Projekt Background:

Pancevo is the administrative center of the South Banat District of Serbia, with 313 937 inhabitants on the area of 4 248 km<sup>2</sup>. It is in the Vojvodina region of Serbia, 15 km northeast from Belgrade. It spreads on 20 km banks of the Tamish River and river Danube. Pančevo population includes the city of Pančevo, the towns of Kačarevo and Starčevo, and seven villages. Population density was 74 per 1 km<sup>2</sup>.

According to the 2002 Census, Pancevo municipality had 127 162 inhabitants, out of which 77,078 live in urban areas. The population of the Pančevo municipality is composed of: Serbs (76.38%), Macedonians (4.14%), Romanians (3.19%), Hungarians (3.17%), Yugoslavs (2.35%), Slovaks (1.24%), Roma (1.09%), Croats 1% etc. Regarding age structure, 71% of population is in productive age, 14% are older than 65 years, and 15%, children under 14 years. In average, population is 39.3 years old (Table 1.).

**Table 1 Age distribution of Pancevo municipality**

Age intervals	No of inhabitants	%
<b>0-4 years</b>	5628	4,5
<b>5-14 years</b>	13954	11
<b>15-64 years</b>	88821	70
<b>65 + years</b>	18759	14,5
<b>Total</b>	127162	100

*Source: Census 2002,  
Regional Statistical Office Republic of Serbia*

Pancevo is a strong industrial town, which is situated on Altitude Sea – level of 78 m top and at least on 70 m. The petrochemical center is extremely developed (fertilizer factory, oil refinery, industry of plastic materials and cosmetic products etc). There is an airplane industry, the glass industry, light industry, beer industry etc. Air quality parametars (SO<sub>2</sub>, Carbon

Black, No<sub>2</sub>, NH<sub>3</sub>, Particulate Mater (PM), Benzene, Xylene, Passive Deposition, Toxic metals and "7 pah") in the Pancevo City are measured on 4 spots. Medians are expose on every 24 hours. Two protective green circles are planned for the city, but it lacks 250 ha of public green areas, according to the normative (50-60 m<sup>2</sup>/per inhabitant). In addition, green areas are too small, unconnected and unequally distributed. In rural households the heating system is not very well regulated, where besides outdoor pollution sources present are asthma triggers like dust mites, pets, pests, secondhand smoke, mold and nitrogen dioxide.

Crude mortality rate is increasing, and more than one third of deaths occurred under 65 years. (Table 2; Table 3).

**Table 2. Crude mortality rates, 2002-2004**

Area	2002	2003	2004
<b>Republic of Serbia</b>	10.4	10.5	10.4
<b>Vojvodina</b>	14.5	15.1	14.8
<b>District South Banat</b>	14.6	15.,2	14.8
<b>Pančevo municipality</b>	12.8	12.9	15.2

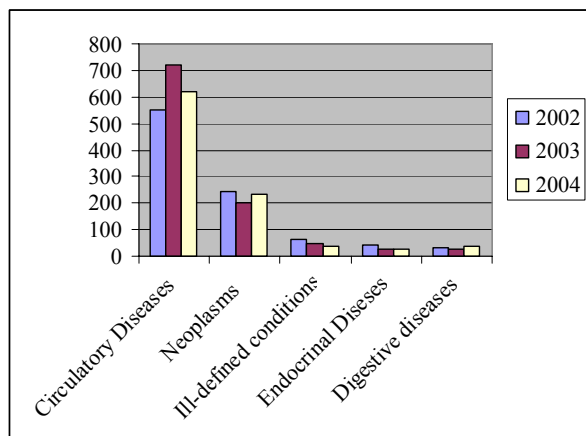
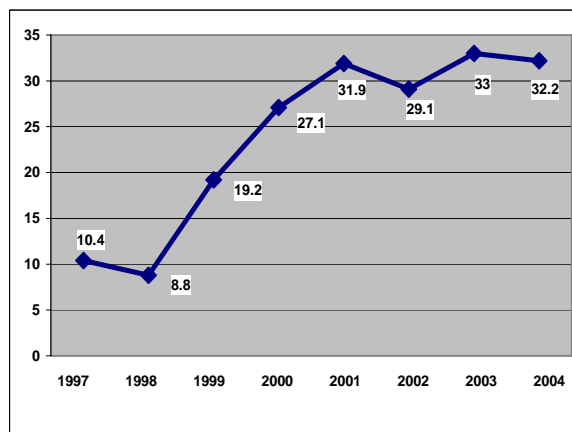
*Source: Regional Statistical Office Republic of Serbia, 2002.*

**Table 3. Mortality age structure, Pancevo 2002-2004.**

Age intervals	2002		2003		2004	
	No	%	No	%	No	%
<b>0-18 years</b>	4	0.5	2	0.2	8	10.0
<b>18-65 years</b>	212	27.0	250	28.8	214	27.5
<b>65+ years</b>	568	72.5	617	71.0	586	72.5
<b>Total</b>	784	100	869	100	808	100

Source: Regional Statistical Office Republic of Serbia, 2002.

Major health problems were noncommunicable diseases, and leading causes of deaths were cardiovascular (65%) and malignant diseases (22-25%). (Figure 1a). There is the trend of increasing mortality due to respiratory diseases. (Figure 1b).

**Figure 1. a) Leading causes of mortality (specific mortality rate per 1000), Pančevo, 2002-2004****Figure 1b) Respiratory diseases mortality rate per 1000, Pancevo, 1997-2004**

Source: Regional Statistical Office Republic of Serbia, 2002.

According to routine health data of the prevalence rates, the most of morbidity is result of acute and chronicle obstructive respiratory diseases, cardiovascular and digestive diseases (Table 4). In average, it looked like that every one in Pancevo had 2 diseases per year. Pancevo is endemic area for allergic diseases.

**Table 4. Morbidity pattern and major diseases in Pančevo (prevalence rate per 1000 population).**

Disease groups	2003		2004	
	No	rate	no	rate
<b>Total</b>	250,271	1968	230,713	1814
<b>Diseases of the respiratory system</b>	106,282	836	91,668	721
<b>Diseases of the circulatory system</b>	21,094	166	23,341	184
<b>Diseases of the urogenital system</b>	23,528	185	20,629	162
<b>Diseases of the musculoskeletal system</b>	16,195	127	13,285	104
<b>Diseases of the digestive system</b>	11,203	88	96,17	76

Source: Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo 2003-2004)

Malignant diseases are increasing slowly, especially breast cancer, lung cancer and colon rectal cancers. Latest study revealed that more than half population is tobacco addicted, and 25-35% are active young smokers. Schoolchildren of Pancevo municipality were more prone to diseases than children of Vojvodina and Serbia (Table 5). Most frequent were diseases of respiratory system, digestive system and senses. Injuries and poisonings were next relevant causes according to the rate per 1000 schoolchildren (Table 6. Figures 2-5).

**Table 5. Schoolchildren (7-18 years) total morbidity prevalence rate per 1000, 2002-2004.**

Area	2002	2003	2004
<b>Republic of Serbia</b>	2,106	2,169	2,071
<b>Vojvodina</b>	2,007	2,170	2,171
<b>Pančevo</b>	3,135	2,862	2,934

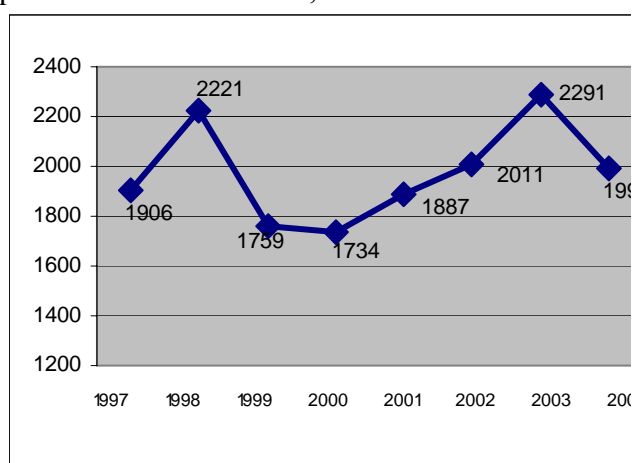
Sources: Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services for Schoolchildren, Republic Institute of Public Health, 'Milan Jovanović-Batut' 2002-2004)

**Table 6. Comparison of prevalence rates of respiratory diseases per 1000 schoolchildren (7-18 years), 2002-2004.**

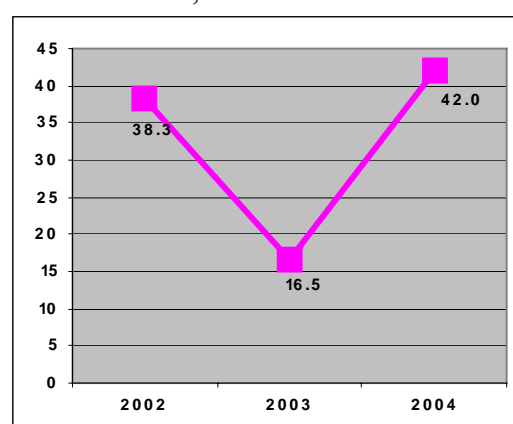
Area	2002	2003	2004
<b>Republic of Serbia</b>	1,267	1,330	1,320
<b>AP Vojvodina</b>	951	1,071	1,120
<b>Pančevo</b>	2,011	2,291	1,993

Sources: Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services for Schoolchildren, Republic Institute of Public Health, 'Milan Jovanović-Batut' 2002-2004)

**Figure 2a. Respiratory diseases prevalence rate per 1000 schoolchildren, Pančevo 1997-2004**



**Figure 2b. Acute, obstructive respiratory diseases, prevalence rate per 1000 schoolchildren, Pancevo 2002-2004**



Sources : Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo

Figure 3. Asthma bronchiale prevalence rate per 1000 schoolchildren, Pancevo 2002-2004

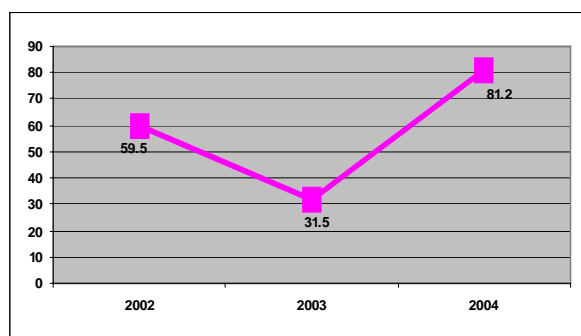
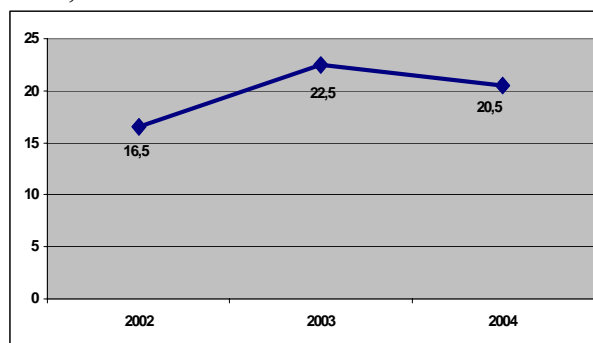
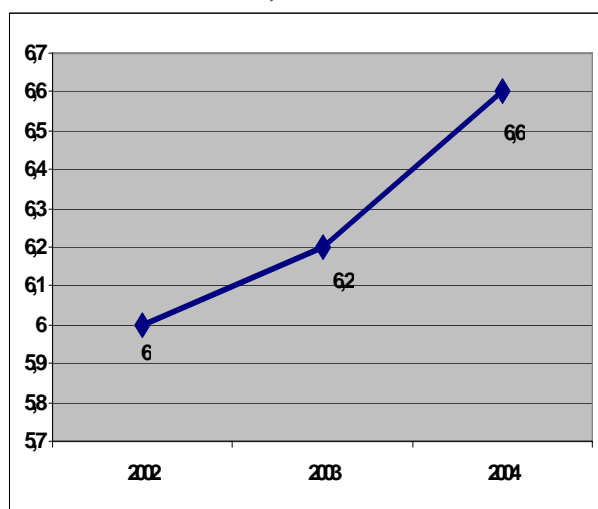


Figure 4. Acute obstructive respiratory diseases in Pancevo adults, prevalence rate per 1000, 2002-2004



Sources: *Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo 2002-2004*)

Figure 5. Prevalence rate of asthma bronchiale per 1000 Pancevo adults, 2002-2004



Sources: *Annual Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo 2002-2004*)

Health services are very well developed and are provided by public and private sector. All population is covered by obligatory health insurance, and according to the Health Insurance Act there is a possibility to obtain voluntary health insurance. National health policy declared primary health care, prevention and health promotion as priorities. Health education lacks in every day health care practice. There is evident need for active participation of more health workers and partnerships in promotion of healthy life styles, in healthy environment protection and lowering the environmental risk factors exposures.

## 2. Basic Priority Rating System (BPRS) Group Scores (1 – 10)

HEALTH PROBLEM	COMPONENTS			BPRS (A + 2B)X C	RANK
	A (1 – 10)	B (1 – 10)	C (1 – 10)		
Diseases of the respiratory system	10	10	3	(10+2*10)x3	90
Cardiovascular diseases	9	10	3	(9+2*10)x3	87
Diseases of the digestive system	6	6	4	(6+2*6)x4	72

## PEARL

Health Problems	P 0 ili 1	E 0 ili 1	A 0 ili 1	R 0 ili 1	L 0 ili 1	PEARL 0 ili 1
Diseases of the respiratory system	1	1	1	1	1	1
Cardiovascular diseases	1	1	1	1	1	1
Diseases of the digestive system	1	1	1	0	1	0

### 3. Health Problem Statement

The health effects of long-term exposure to low levels of air pollution were studied.(1,2,3,4) Air pollution episodes have been associated with increased cardiovascular hospital admissions and mortality in time-series studies, cancer and long-term damage to the immune, neurological, reproductive, and respiratory systems and recent study results suggest that elevated levels air pollutants are associated with potentially life-threatening arrhythmia. (1,2,5) The effects of both ambient air pollution and socioeconomic position on health were also well documented.(1) Knowing that average adult breathes about 3,400 gallons of air a day, it makes certain groups of people more sensitive to the effects of air pollution than others. Children breathe even more air per pound of body weight and are more susceptible to air pollution. They also experience more illness, such as bronchitis and earaches, in areas of high pollution than in areas with cleaner air. Bronchial hyperresponsiveness tests can be used to support the evaluation of an air quality intervention.(4). People exposed to high enough levels of certain air pollutants may experience burning in their eyes, an irritated throat, or breathing difficulties. The refining process can cause many different chemicals to be released into the atmosphere Many air pollutants, such as those that form urban smog and toxic compounds, remain in the environment for long periods of time and are carried by the winds hundreds of miles from their origin. Environmental and safety concerns mean that oil refineries are usually located a safe distance away from major urban areas. Environmental groups have lobbied many governments to increase restrictions on how much material refineries can release, and many refineries have installed equipment and changed practices to lessen the environmental impact.(2) During the long period (1921-1996) Serbia and Montenegro, ratified 62 international conventions in the field of the environment. From 2004 up to now, four new laws were inaugurated in the Republic of Serbia, focused on integrated protection and control of living environment, and strategic assessment of exposures. Previous analysis on Pancevo population health status clearly stated, that main health problem are respiratory diseases (Figure 6). Contextual analysis of possible interventions in Pancevo was done with Intervention decision matrix instruments. It showed that media pressure for respect of law regulations on particle concentration and educational intervention will be most appropriate to be implemented and with higher impact. Others were either hard to be realized in close future (too expensive) or with low effects. Adequate action plan will comprise twofold health promotion intervention:

- 1<sup>st</sup> Educational intervention: Raising community awareness on indoor and outdoor pollution exposures and, to create empowered citizens who will be motivated for active participation in health protection of community (Eco Schools).
- 2<sup>nd</sup> Intervention: Networking with main stakeholders to increase green protected areas with plants in Pancevo (Green Actions)

During the first year of the Project, in total six eco schools will be organized and conducted for 150 citizens. Each eco school will last one month, with eight educators. Main topics will

be held to increase knowledge on environmental health risks for respiratory system, on rights for health living and working conditions and to overcome barriers and wrong preconceptions, as well as to build skills for self-protection and for lowering exposure risks. Collateral outcomes of the Eco schools will be ecological messages for Radio spots, and posters for website of Pancevo city, and schools exhibitions. Monitoring of the Eco School will be responsibility of the PaO<sub>2</sub> team. Formative, process evaluation of this Project phase will be internal (PaO<sub>2</sub> team) and summative evaluation (knowledge) will be external (Prof. V. Bjegovic, Center - School of Public Health, Belgrade). Overall budget for Eco School will be 2,583,560dinars, out of which 1,858,080dinars will be donated from Team PaO<sub>2</sub> resources. For the next two years, networking on environmental health protection is planned. Volunteers, eco school participants, local NGO, industry stakeholders, local public organizations and community authorities would be jointed with PaO<sub>2</sub> team with purpose to create new green areas with trees and other plants. These actions should be sustained, with new environmental regulations authorized by local community policy makers. Monitoring of the air pollution emissions and health statistics data will be done, besides process and outcome assessments of this second Project phase, by Team PaO<sub>2</sub>. Overall budget for Green Actions intervention will be 1,296400dinnars, all donated from local community organizations. Monitoring the indicators of impacts of both interventions will continue at least 5 years after completing this Project. Since, it was showed that the potential impact of an intervention increases independently with the pre-intervention prevalence of the risk category, and with the reduction in risk-category prevalence achieved by the intervention, the decision was made to *decrease respiratory diseases prevalence rate in schoolchildren of Pancevo, for 10% in the next 5 years time period, baseline year 2004*. Designed interventions, detailed work breakdown structures and monitoring and evaluation plans are presented below with summed Project Budget table.

## 5. Objectives

Health Problem Statement: *Prevalence rate of respiratory diseases in schoolchildren of Pancevo* was 1993 in 2004.

Outcome objective: *Prevalence rate of respiratory diseases in schoolchildren of Pancevo* will decrease for 10 % in 5 years period.

Determinant of health problem (1): High prevalence of respiratory infections and acute and obstructive respiratory diseases, in the 2004. among schoolchildren, 7-18 years (Asthma bronchiale prevalence rate was 81,2 per 1000 and Acute and obstructive respiratory diseases prevalence rate was 42 per 1000 schoolchildren)

Impact objective,1: *Prevalence rate of acute obstructive respiratory diseases and infections among schoolchildren of Pancevo* will decrease for 10 % in 4 years period.

Determinant of health problem (2) Pancevo city has high air pollution particles concentration according to the actual normative in 2004.

Impact objective, 2: Air Pollution particles concentration will be less for 5% in 5 years.

Direct contributing factor: Pancevo city lacks pollution protective green areas of 250 ha according to the actual normative.

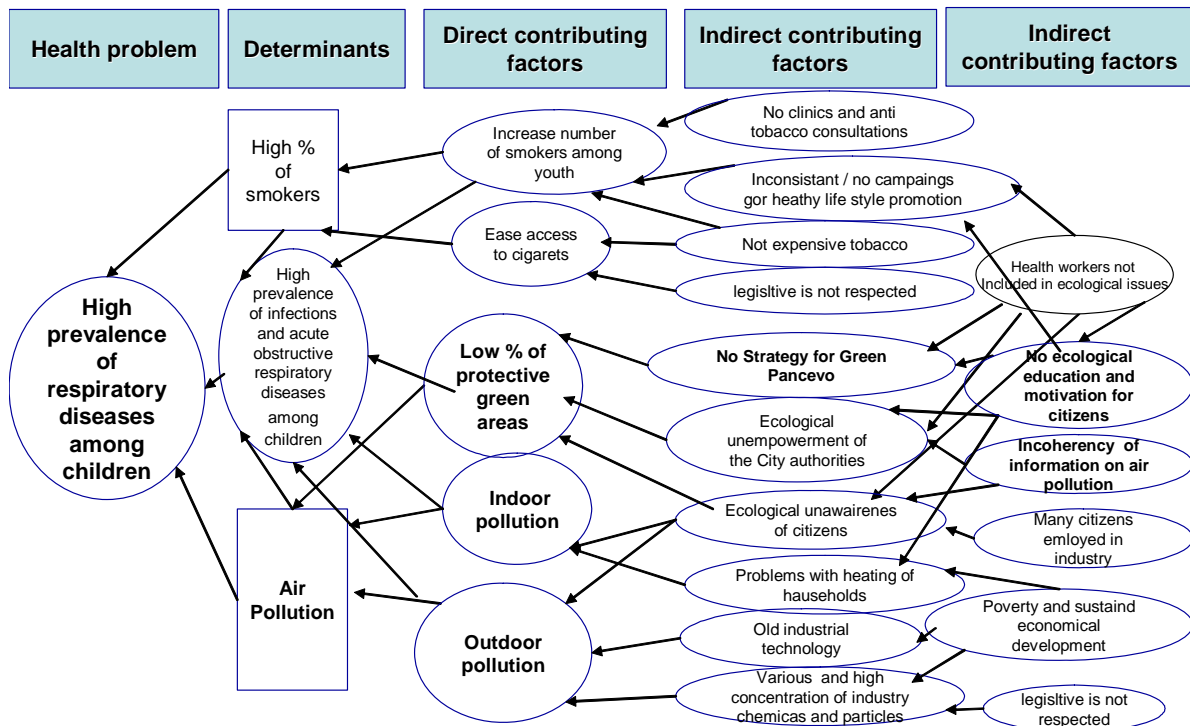
Impact objective,3: Green areas in Pancevo city will rise for 2 % (5 ha) in 2 years period.

Indirect Contributing factor: Unawareness of air pollution (indoor and outdoor) exposure consequences and regulations for healthy environment, as well as low practical knowledge on self-protection skills among target population strata and passive participation of public health workers in ecological issues .

Process objective: Six Eco Schools will be held for target groups in Pancevo population: 100 schoolchildren of 7-18 years and 50 adults (workers and unemployed people) during 1. year of project.

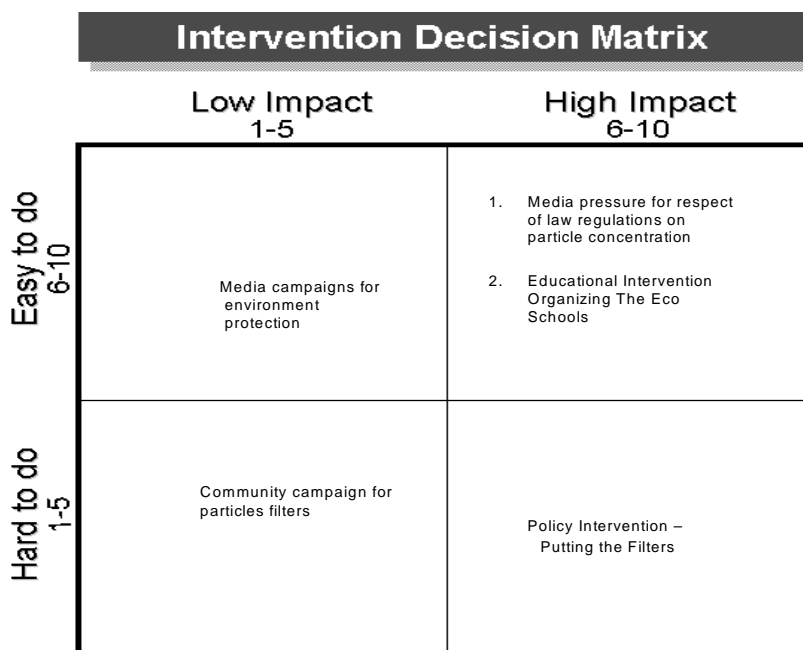
Figure 6.

## Respiratory diseases – Analysis of health problem in Pancevo



Intervention Decision Matrix(1)

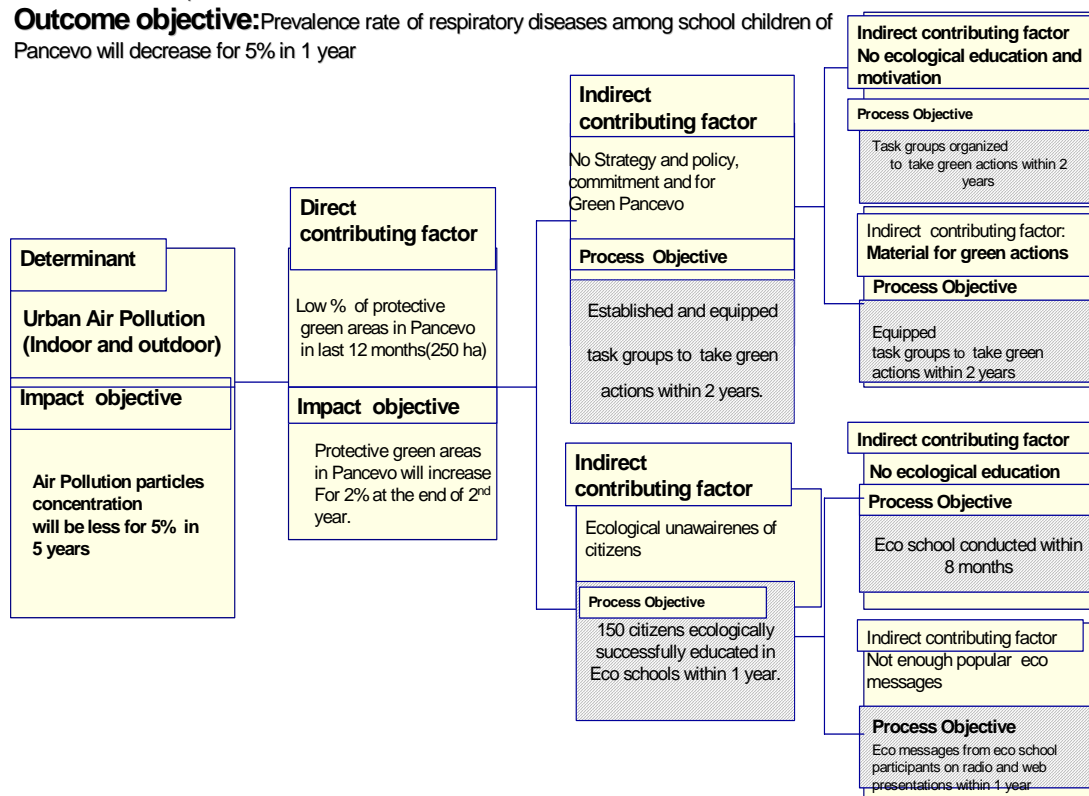
Indirect Contributing factors	Intervention activities	Impact	Easy to do
High concentration of chemicals in the air, and Old technology	Community campaign for particles filters	2	2
High concentration of chemicals in the air, and Old technology	Policy intervention Putting the Filters	8	3
Legislative not respected	Media pressure for respect of low regulations on particle concentration	7	7
No popular ecological education on indoor and outdoor pollution,health workers do not participate in ecological issues Incoherencia of information on air pollution	Educational Intervention Organizing The Eco Schools	6	6
Irresponsibility to environment protection	Political Intervention Media campaigns for environment protection	4	6



## INTERVENTION STRATEGY AND OBJECTIVES

**Health problem:** Prevalence rate of respiratory diseases among school children of Pancevo was 1993 per 1000 in last 12 months

**Outcome objective:** Prevalence rate of respiratory diseases among school children of Pancevo will decrease for 5% in 1 year



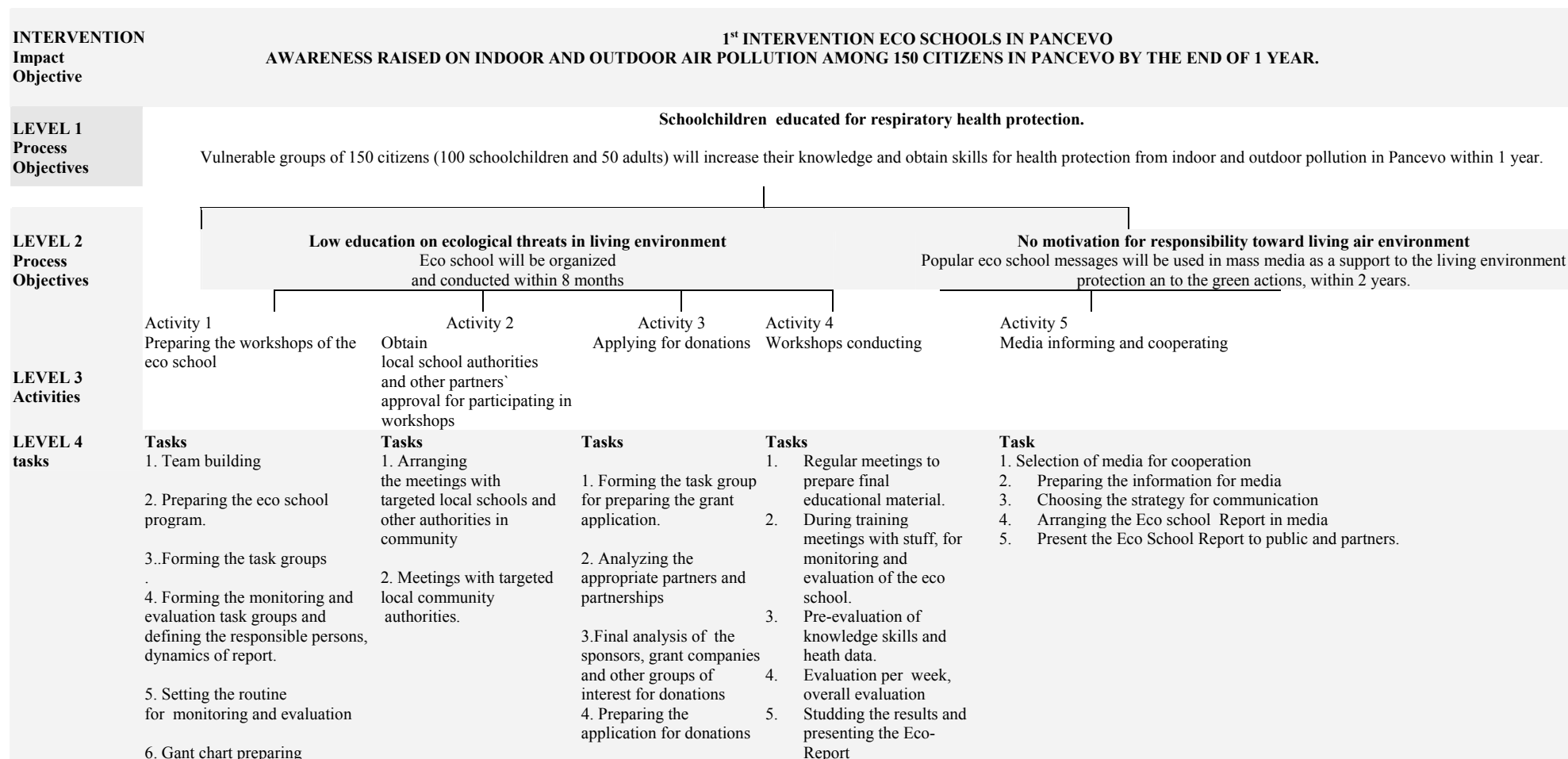
# Intervention Design Table

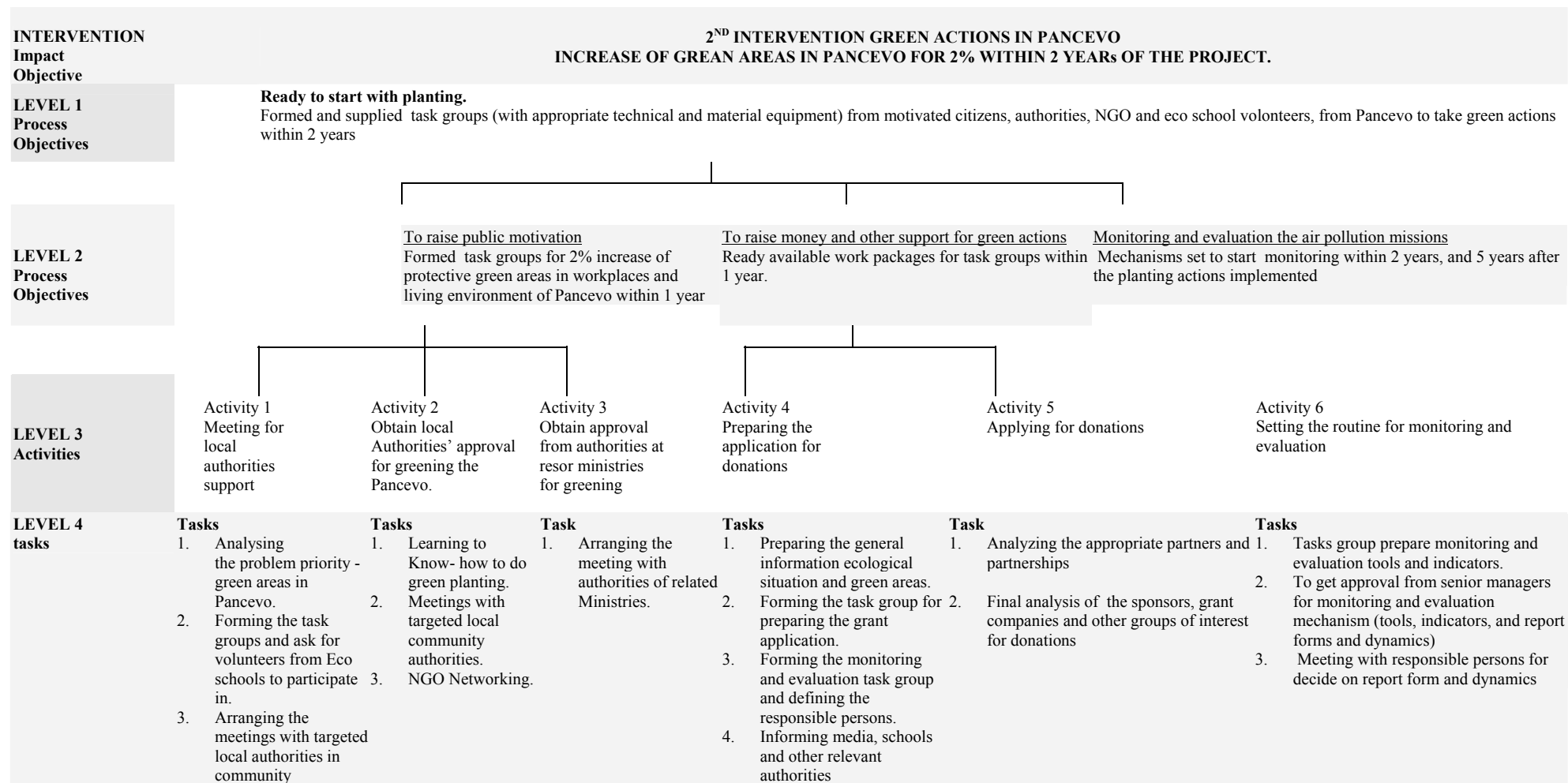
<b>Health problem: Prevalence rate of respiratory disease among school children was 1993 per 1000 in the last 12 months</b>					
<b>Determinant: urban air pollution</b>					
<b>Direct contributing factor: Low % of protective green areas in Pancevo (lack of 250 ha)</b>					
<b>Indirect contributing factor(1): Ecological unawareness of indoor and outdoor pollution</b>					
<b>Intervention strategy</b>	<b>Target group for change?</b>	<b>What is going to change?</b>	<b>Type</b>	<b>Intervention Location</b>	<b>Volume</b>
Community educational intervention  Organizing Eco Schools and creating popular eco messages.	Schoolchildren 7-18 years  Adults, employed and unemployed	To increase knowledge on pollution, to adopt skills and learn measures for health protection of respiratory system	Six workshops in Eco schools and mass media.  One workshop per month.	Institute of Public Health, Pancevo, Schools, working places and homes.	150 participants in 6 months
<b>Indirect contributing factor(2): No Strategy and policy, commitment and for Green Pancevo</b>					
<b>Intervention strategy</b>	<b>Target group for change?</b>	<b>What is going to change?</b>	<b>Type</b>	<b>Intervention Location</b>	<b>Volume</b>
2. Community and political  Support for living environment protection, and enlarging the green areas in Pancevo	Households City authorities, Industry stakeholders	To rise awareness, motivation, and readiness for protect own living environments.	Community action for building green areas and planting trees.	In the circle of the City assembly Building and center of the highest pollution – oil pumps, fabrics and schools	New 2 % of green areas in Pancevo

## BUDGET in DINARS

ITEMS	YEAR 1 ECO SCHOOL	YEAR 2 GREEN ACTIONS	TOTAL
PERSONNEL	647,520	746,000	1,393,520
EQUIPMENT	1,755,480	12,000	1,767,480
SUPPLIES	77,960	80,000	1,57,976
OBJECTS	52,200	408,000	460,200
CONTRACTS	50,400	50,400	100,800
TRAVELS	/	/	/
OTHER	/	/	/
SUM	2,583,580 Own resources 1,859,080 Needed resources 725,480	1,296,400 All from IPH Pancevo and sponsors Needed 0,00	3,879,980 Needed resources 725,480 dinars
























Monitoring and Evaluation Plan						
Health problem: High prevalence rate of respiratory diseases		Objective: Prevalence rate of respiratory diseases in schoolchildren of Pancevo will decrease for 10 % in 5 years period.				
Indicator	Data source	Frequency	Individual responsibility	Report how often	To whom	Comment
Prevalence rates of respiratory diseases in schoolchildren	Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo	Monthly	Task leader	Per 3 months	Project Coordinator	During project and 5 years after
Determinant: High prevalence of acute obstructive respiratory diseases and infections among schoolchildren		Objective: <i>Prevalence rate</i> of acute obstructive respiratory diseases and infections among schoolchildren of Pancevo will decrease for 10 % in 4 years period.				
Indicator	Data source	Frequency	Individual responsibility	Report how often	To whom	Comment
Prevalence of acute obstructive respiratory diseases and infections among schoolchildren	Health Statistic Reports on Morbidity and Utilization, Primary Health Care Services, IPH Pancevo	Monthly	Task leader	Per 3 months	Project Coordinator	During project and 5 years after
Direct contributing factor: Low percentage of protective green areas		Objective: Green areas in Pancevo city will increase for 2 % (5 ha) in 2 years period.				
Indicator	Data source	Frequency	Individual responsibility	Report how often	To whom	Comment
Percentage of public Green areas	Public organizations statistical data	Three months	Coordinator of green actions	Per 6 months	Project Coordinator	Biologist as coordinator of for green actions
Air pollution particles parameters	IPH ecological service reports	Monthly, during project	Team member	Per year	Project Coordinator	During project and 5 years after

Indirect contributing factor(1): Ecological unawareness of pollution risks		Objective: 150 citizens ecologically successfully educated in Eco schools within 1 year				
Indicator	Data source	Frequency	Individual responsibility	Report how often	To whom	Comment
Changed level of ecological knowledge	Questioners	12 x per month	Team members	Per year	Coordinator of project	
Indirect contributing factor(2): No commitment for Green Pancevo strategy and policy		Objective Established and equipped 2 task groups to take green actions within 2 years				
Indicator	Data source	Frequency	Individual responsibility	Report how often	To whom	Comment
Number of formal applications for green activities. Number of eco-organization, volunteers and other interest groups	City authorities confirmation	2 x per year	Coordinator for community	Per 6 month	Coordinator of project	And to Coordinator for community
	Project documentation		Team member	Per 3 month	Project coordinator	
Ratio of planned vs. realized radio spots and web-site visits	Radio station confirmation about radio spots and administrator confirmation about visiting web-site	Monthly	Task leader	Per 3 months	Supervisor for health education	
Exhibition of eco posters and eco messages	City authorities confirmation	Monthly	Task leader	Community coordinator	Project coordinator	

Tasks	Schedule in Months								Responsibilites			Project Status		
Intervention A: Conducting Eco Schools	Start	Complete	1	2	3	4	5	6	7	8	Responsible	Participial	Approval	As of (date)
A.1 Eco-School organisation	01.sep.	01.maj									Ljilja L.	8	Coordinator	
Preparing the Eco Schools	01.09.	01.10.									Jelena	8	Coordinator	
Team building	01.09.	01.09.									Ljilja B.	8	Coordinator	
Task groups forming	03.09.	01.10.									Osman	8	Coordinator	
Information of Eco Schools	03.09.	01.05.									Jelena	4	Coordinator	
Preparing questioners	03.09.	01.10.									Mira M.	8	Coordinator	
Sponsors contacting	03..09.	01.10..									Ljilja K.	8	Coordinator	
Conducting the work shops	01.10.	01.03.									Ljilja L..	8		
Schoolchildren	01.10.	01.01.									LjiljaL.	8	Coordinator	
Adults	05.01.	05.05.									Ljilja L.	8	Coordinator	
Evaluation Eco Schools	03.09.	01.05.									Mira M.	4	Coordinator	
Preparing questioners	01.09.	01.10.									Ljilja L.	8	Coordinator	
Investigation	01.10.	01.05.									Ljilja L.	8	Coordinator	
Study results	01.04.	20.04.									Ljlja L..	4	Coordinator	
Health service utilization data pre and post Eco schools	01.04.	01.05.									Ljlja K.	4		
Eco NGO data pre and post Eco Schools	01.04.	01.05.									Ljlja K.	4	Coordinator	
Results presentation	20.04.	01.05.									Ljilja L.	8	Coordinator	

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