Urban Effects on Sanitation and Resource Management in Suburb; Case Study in Hanoi, Vietnam

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***Key Words**: Hanoi City, Sanitation and Resource Management, Phosphorus Flow*

1. BACKGROUND

In recent years, the decreasing of farmland and deterioration of irrigation water quality is happened by increasing of industrial area and expansion of urban in suburb. And the reducing of traditional recycling system leads the increasing of wastewater runoff and resource demands by introduction of intensive agricultural way. Now projects of foreign aids and researchers focus on urban area mainly, however, they cannot realize the relationship between suburb and urban. Therefore, no one tackle the issue of urban effects on suburb and identify the state of suburb of Hanoi. This research will consider the current state of urban effects quantitatively by creating a phosphorus flow based on the interview, sampling and literature survey. And this research will also examine the issue of sanitation and resource management in 2020 by estimated future phosphorus flow.

2. METHODOLOGIES

(1) Firstly, interview survey was conducted on downstream of urban river for understanding of the current state of sanitary and resource management in the farmland. (2)Phosphorus flow was created based on interview and literature survey on the district and commune level for quantitative understanding of the current sanitary and resource management in suburb.(3)Phosphorus flows in 2020 were estimated based on the interview survey and phosphorus flow in 2009 to understand urban effects ad effectiveness of the urban plan for wastewater and waste management.

3. RESULTS

(1) Understanding of Urban Effects in Suburb

As a result of interview, people in rural area operated high proportion of resource recycling, however, by introduction of flush toilets and transformation of agriculture, they lost their recycling way. Results also showed the health risk and damage for agricultural production by contaminated river water by effects of urban and industrial area.

(2) Developing of Phosphorus Flow in Suburb

Recycling resources supplied almost 70% of phosphorus inputs in agriculture, while irrigation water supplied about 10% of inputs in sub urban area and 30% in down stream commune. It could be regarded as urban effects and it showed urban effects became strong along with the river.

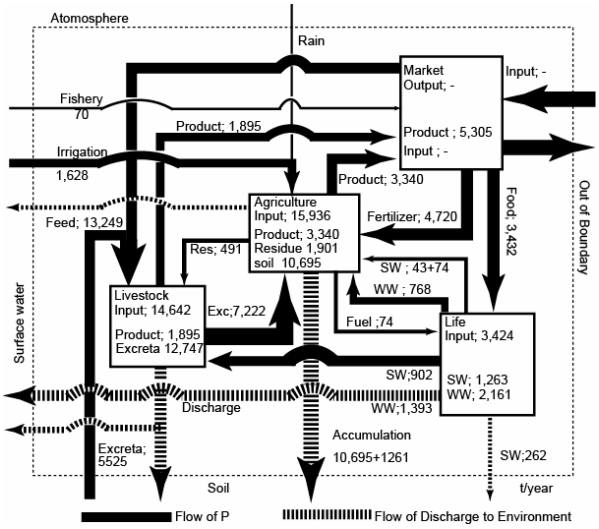

Fig.1 Phosphorus flow in sub urban area

(3) Future Forecast of Phosphorus Flow in Hanoi

In the forecast, reduction of the resource recycling and discharging of wastewater were estimated and it showed effectiveness of the urban plan as wastewater treatment plants in urban area, while in the sub urban area, resource demands, landfill and discharging were estimated to increase in 2020.

4. CONCLUSION

This research showed the current state of sanitation and resource management and potential of traditional resource recycling. This research also found urban effects on sub urban area as irrigation water. In the future forecast, sub urban area was estimated to be main pollution source in 2020 as urban area, therefore, suburb should be focused on for watershed management as urban area and on the point of sanitation and resource management, traditional resource recycling should be rethink its potential.