Standardization of on-site treatment in China

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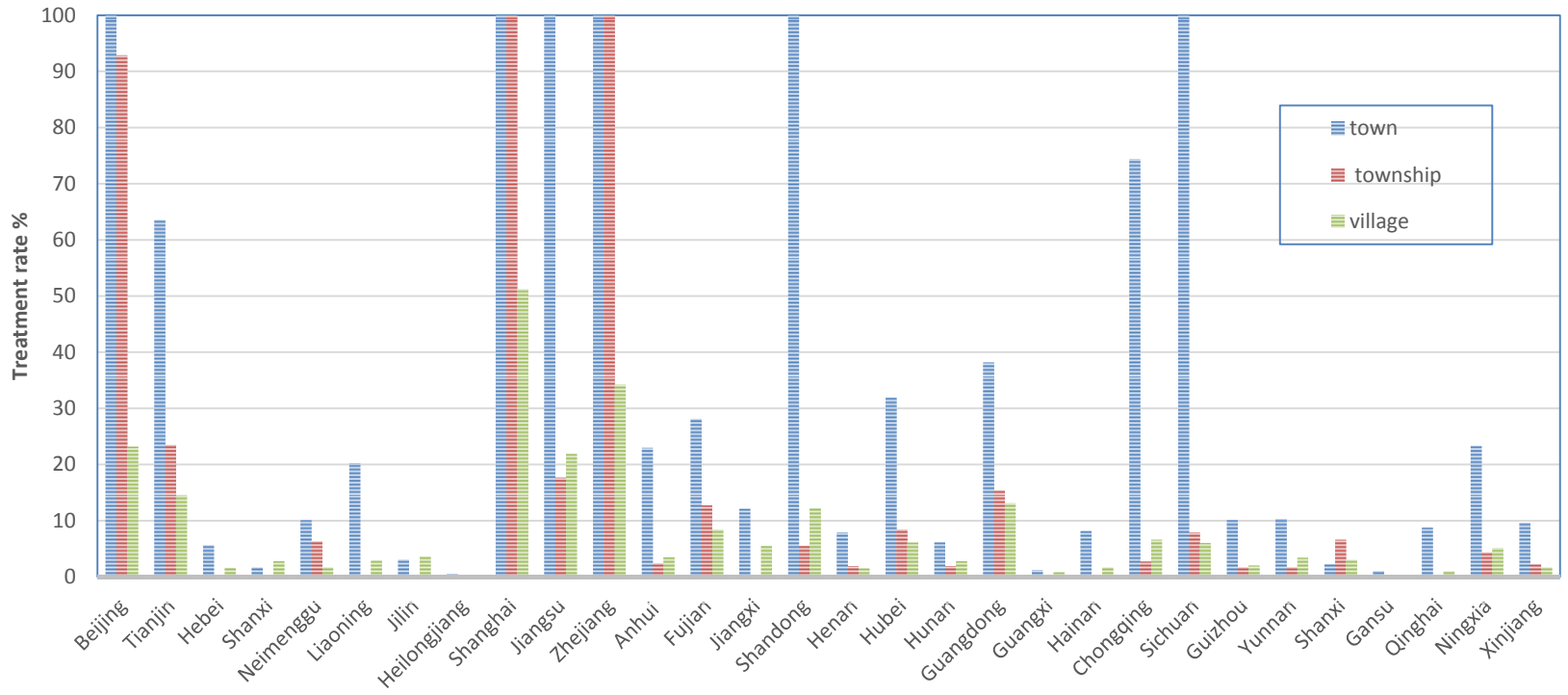
standards of on-site wastewater treatment

Domestic wastewater treatment rate in 2011year

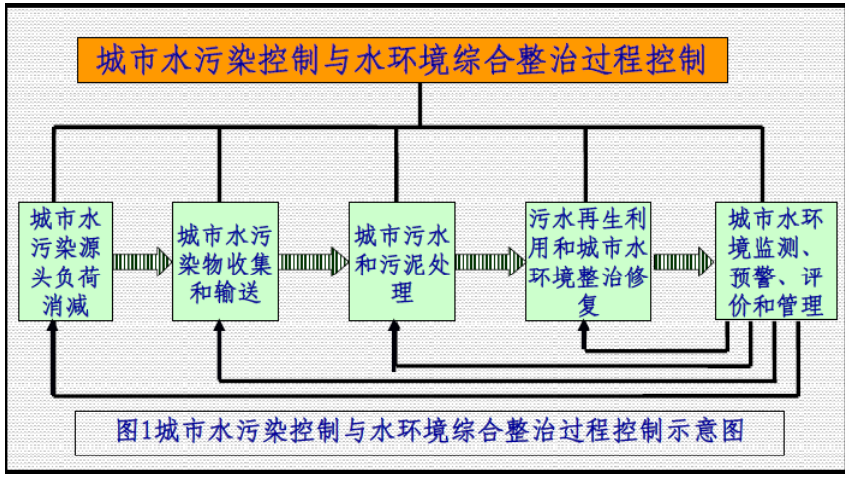


Up to the and of 2010, 22.9% of domestic wastewater from towns and villages

Situation

- **Lack of knowledge of decentralized systems**
- **Lack of long-term operation data**
- **Management needed**
  - **systems are a cost-effective and long-term option for meeting public health and water quality goals**
  - **Who is responsible? Typically homeowner for onsite，Inadequate methods of needs assessment**

Standard system of off-site wastewater treatment



Standard system of on-site wastewater treatment

- ☑ Technique code for village rehabilitation (GB-50445-2008)
- ☑ Technical specification of wastewater engineering for town and village (CJJ124-2008)
- ☑ Technical Specification of wastewater treatment facilities for village (CJJ/T163-2011)
- ☑ Complete equipment for domestic wastewater plant (CJ/T 355-2010)
- ☑ Technical guide for rural domestic wastewater treatment in different regions


UDC

GB

中华人民共和国国家标准

P

GB 50445—2008

村 庄 整 治 技 术 规 范

Technique code for village rehabilitation


UDC

中华人民共和国行业标准

CJJ

P

CJJ 124—2008

镇(乡)村排水工程技术规程

Technical specification of wastewater engineering for town and village

Technical Specification of wastewater treatment facilities for village (CJJ/T163-2011)


UDC

中华人民共和国行业标准 CJJ

CJJ/T 163–2011

P 备案号 J 1219–2011

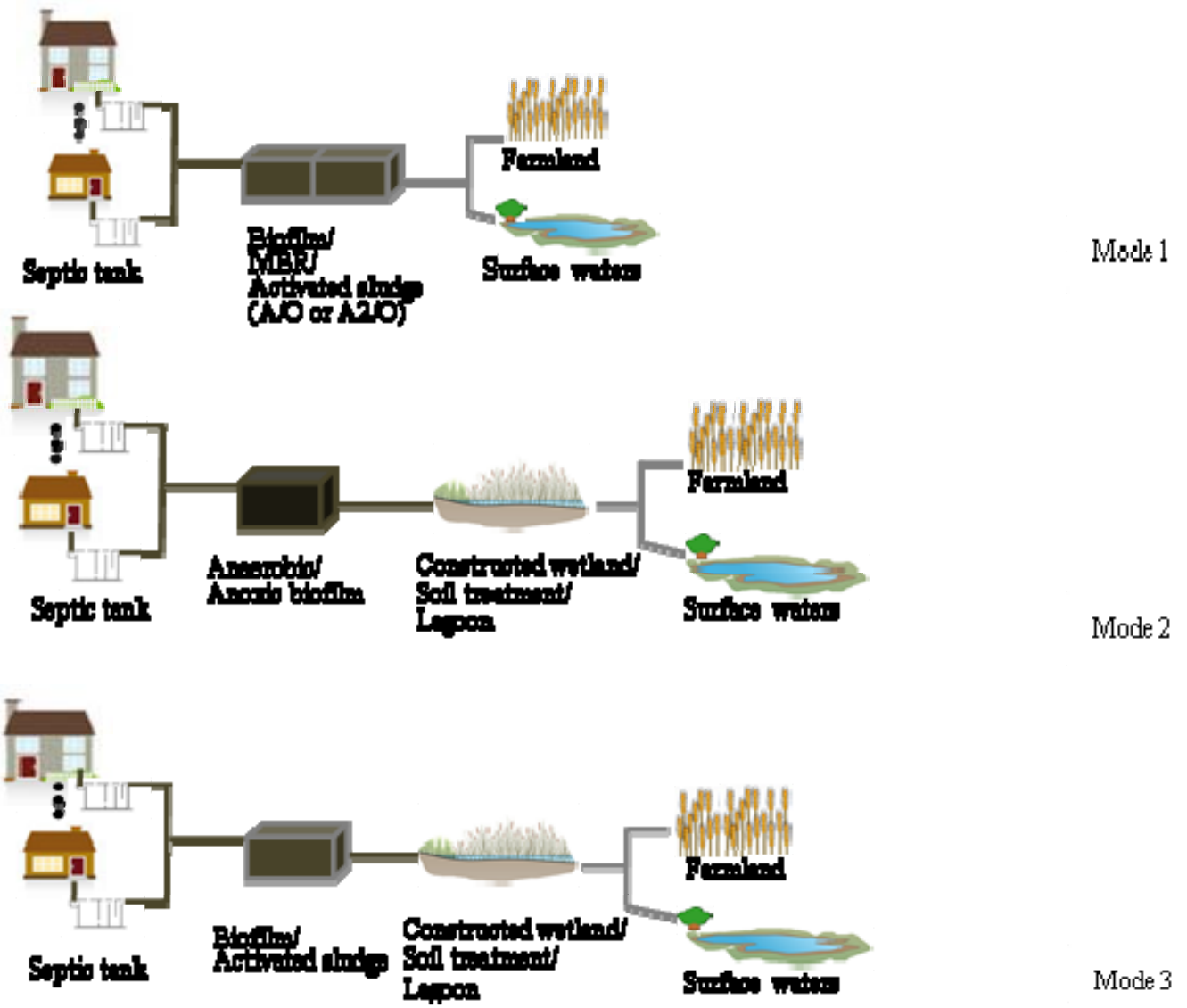
村庄污水处理设施技术规程

Technical specification of wastewater treatment facilities for village

2011–07–13 发布 2012–03–01 实施

中华人民共和国住房和城乡建设部 发布

Main models of on-site wastewater treatment in China



Main contents

How to choose the suitable technology for rural area?

1 General provisions
2 Terms and symbols
3 General requirement
4 Treatment technologies
- Anaerobic biofilm tank
- Biological contact oxidation tank
- Biological aeration filter
- Oxidation ditch
- Rotating biological contactor
- Activated-sludge process
- Ecological treatment of wastewater
- Chemical phosphorus removal
- Disinfection

5 Wastewater treatment facilities in village
6 Wastewater treatment station in village
- Wastewater treatment station for COD removal
- Wastewater treatment station for nitrogen removal
- Wastewater treatment station for nitrogen and phosphorus removal

7 Construction and acceptance of engineering quality

Main contents

Discharged standard：

- **Discharge**
- **Reuse**

Items	Grade IA	Grade IB	Grade II
COD	50	60	100
T-N	15	20	-
NH_4-N	5(8)	8(15)	25(30)
T-P	0.5	1	3

Unit: mg/L

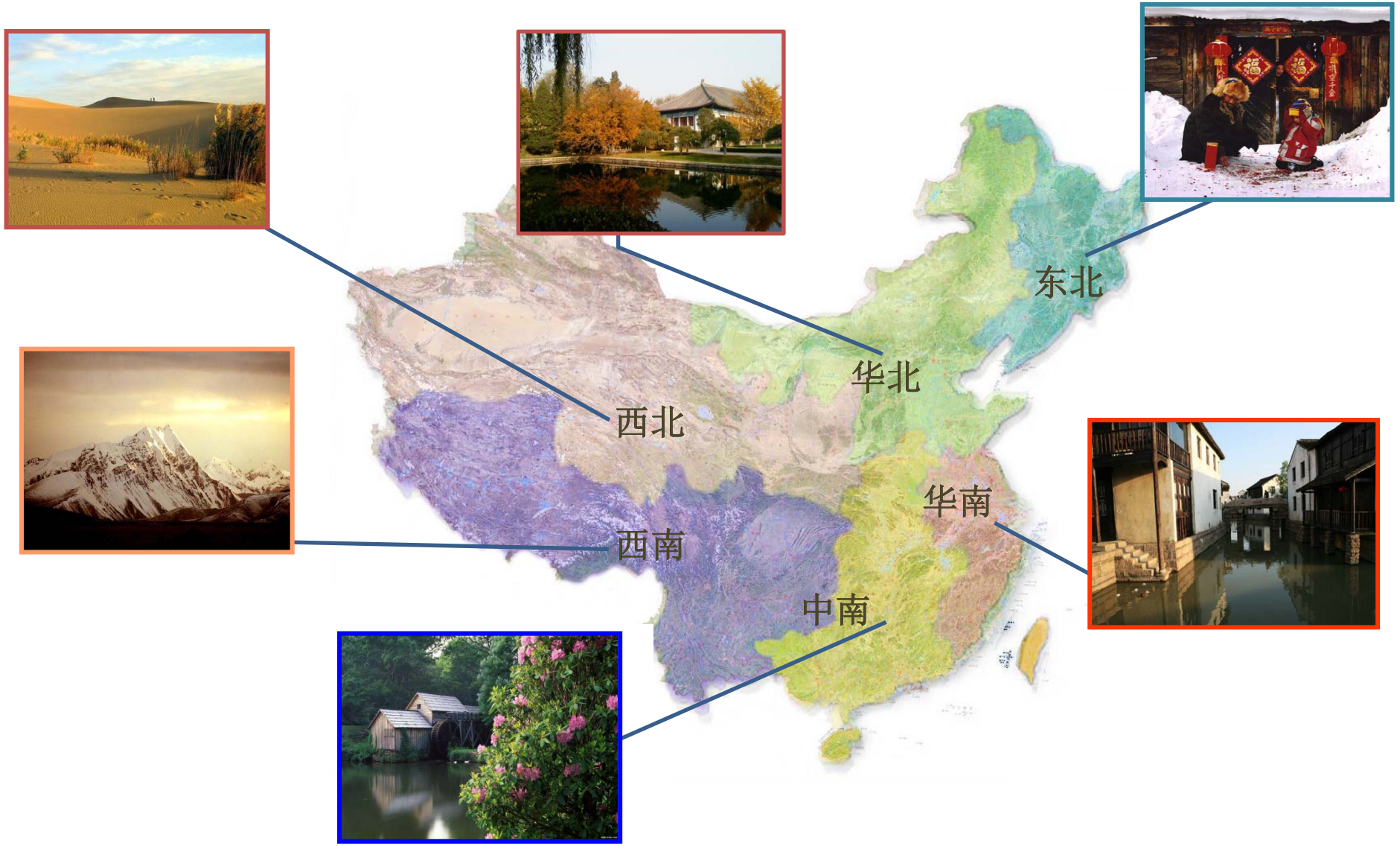
3.0.3 污水的排放要求直接关系到污水处理程度和技术选择，因此，农村生活污水的排放要求需根据国家和地方的排放要求因地制宜地确定，以保证污染物消减目标的实现和降低成本。在没有排放要求的农村地区，针对地区的特征，建议按表 1 参考不同的排水去向的排放要求。

表 1 村庄污水排放执行的相关参照标准

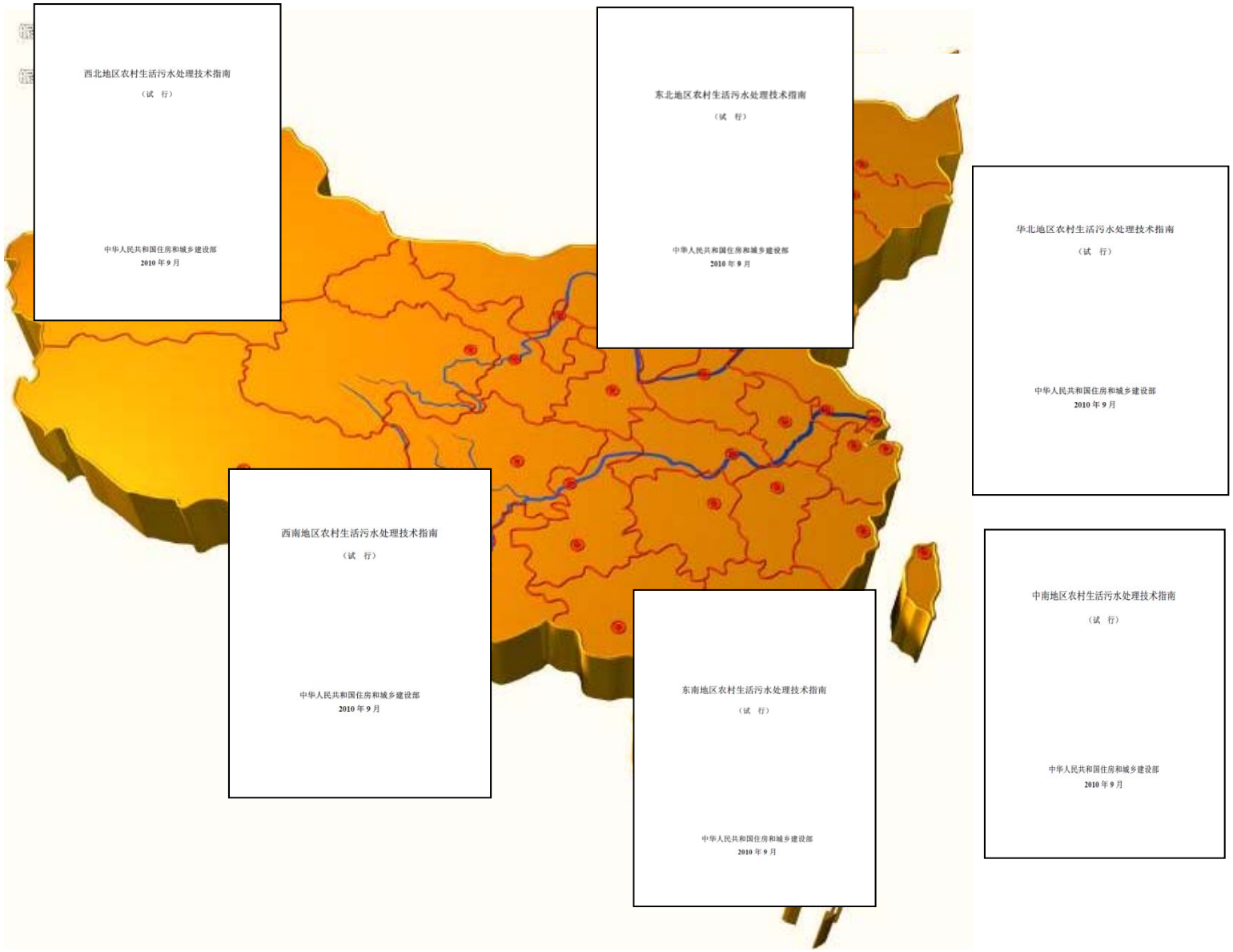
排水用途	直接排放		灌溉用水		渔业用水	景观环境用水
参考标准	污水综合排放标准 GB8978-1996	城镇污水处理厂污染物排放标准 GB18918-2002	农田灌溉水质标准 GB5084-2005	城市污水再生利用农田灌溉用水水质 GB 20922-2007	渔业水质标准 GB11607-89	城市污水再生利用景观环境用水水质 GB/T18921-2002

Technical guide for rural domestic wastewater treatment in different regions

Technical guide for rural domestic wastewater treatment in different regions



Technical guide for rural domestic wastewater treatment in different regions



Wastewater in different regions

Domestic water use (L/P.day)

Types of village	Northeast	North south	North	West north	West south	South
Good economic， bath ,flush toilet ,wash mashine	80-135	90～200	100~145	75～140	80-160	100～180
Good economic, bath and kitchen	40-90	80～100	40~80	50～90	60-120	60～120
Normal economic ,simple toilet	40-70	60～90	30~50	30～60	40-80	50～80
No flush toilet	20-40	40～70	20~40	20～35	20-50	40～60

Charactics of wastewater (mg/L)

主要指标	pH	SS	COD	BOD_5	NH_4^+-N	TP
West south	6.5~8.5	100-300	100-400	50-300	3-50	1.0-6.0
Northeast	6.5-8.0	150-200	200-450	200-300	20-90	2.0-6.5
North south	6.5~8.5	100~200	70～300	150~450	20~50	1.5~6.0
North	6.5~8.0	100~200	200~450	200~300	20~90	2.0~6.5
West north	6.5～8.0	150～200	150～400	100～150	20～50	2.0～6.0
South	6.5~8.5	100~200	100~300	60~150	20~80	2.0~7.0

Technical guide for rural domestic wastewater treatment in different regions

Northeast: septic tanks, anaerobic biofilter, bio-contact oxidation tank, land treatment, constructed wetlands, lagoon

North China : septic tanks, sewage digesters, aeration tank, sequencing batch bio-reactor, oxidation ditch, biological contact oxidation , constructed wetlands, land treatment

Northwest :septic tank, anaerobic digesters, anaerobic biofilter, constructed wetlands, land treatment..

Southwest: septic tanks, wetland, land treatment, anaerobic technology, bio-contact oxidation tank, oxidation ditch, anaerobic biofilter

Middle south: septic tanks bio-contact oxidation, oxidation ditch, constucted wetland, lagoon, floating islands could be applied for sewage treatment.

southeast: septic tank, anaerobic biofilter, anaerobic digesters; biological contact oxidation tank, oxidation ditch, constructed wetlands, ecological filter.

- **Complete equipment for domestic wastewater plant (CJ/T 355-2010)**
- **Household sewage treatment plant**

Main contents

Less than 50 M^3/day Facilities

Less than 2M^3/day Facilities

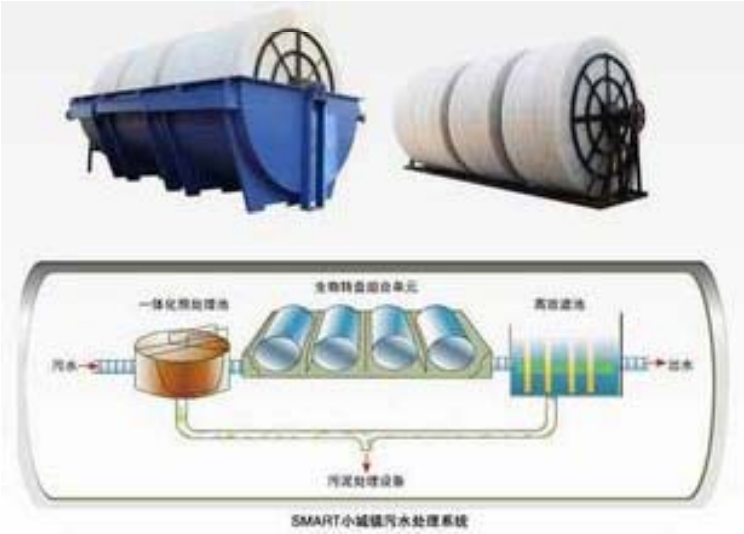
- **Discharge:**

  Biofilm

- **Reuse:**

  MBR

	Technologies	P	G
1	Anaerobic +biofilm	√	——
2	Anoxic- oxic biofilm	√	——
3	Anaerobic digestion	——	√
4	Anoxic/ anaerobic biofilm	——	√



Challenges and future

Challenges and future

- **The standards of rural sewage drainage currently follow a uniform urban sewage treatment plant emission standard. However, attaining these urban standards is difficult using rural technologies and is unrealistic based on the economic potential of rural areas. Thus, rural characteristics must be taken into account when developing new sewage, drainage and water quality standards. Furthermore, whether effluent from sewage facilities is reused for irrigation or discharged into surrounding water bodies, it must meet a certain quality standard. There should be an emphasis on reusing effluent for more sustainable sewage treatment practices in Chinese villages.**
- **In rural areas, there is a lack of supervision in sewage treatment facilities, resulting in operational problems and poor implementation of treatments such that facilities are running at a lower standard than is expected. We recommended identifying the appropriate regulatory authorities to be responsible for daily testing of water quality in sewage treatment facilities.**
- **Surface water bodies in rural areas are the main source of water for the livelihood of villagers. However, these water bodies are also used for the discharge of sewage, so sanitation must be monitored for the health of villagers and the environment. Lack of disinfection of effluent discharged from rural sewage treatments could cause the spread of potentially dangerous pathogens, therefore, suitable disinfection processes must be applied in the rural sewage treatment process.**

Thanks for your attention!